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**The Role of eco-villages in Community-Based
Environmental Education:
A Comparative Study of Communities in
Sri Lanka and the United Kingdom**

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A Thesis Submitted in Fulfilment of the Requirement for the

Degree of Master of Arts

Sajini Madhavi Pathiraja

The School of Education

University of Durham

2007



18 APR 2008

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ABSTRACT

This thesis explores the role of eco-villages in community-based environmental education and presents a comparative study of eco-communities in Sri Lanka and the UK. In Sri Lanka, the focus is upon the village of Damniyamgama, and in the UK the focus is upon Findhorn village in Scotland.

Community-based environmental education is in its infancy, yet is gradually becoming recognised as a crucial process given the rapidly deteriorating 'environmental health' of planet Earth. This thesis sets the context by outlining some of the major environmental problems the world faces. It then addresses the development of environmental education, theoretical perspectives relevant to the emerging field of community-based environmental education, the role of NGOs and the concept of an eco-village.

The empirical dimension is presented as research-based case studies of the two contrasting eco-villages. Visits were made to both sites and in-depth interviews were conducted. Data from these interviews were combined with information derived from informal discussions, observations and secondary sources to enable analysis to be undertaken. Through this combination of literature review and empirical research, the thesis examines how successfully concepts and practices of sustainable development are incorporated within Damniyamgama and Findhorn eco-villages; how educational activities are conducted in both locations and the role that the villages play in changing attitudes and practices.

Comparisons are made between the case study villages and transferable outcomes are identified. Finally the thesis identifies areas that would benefit from further development in the eco-villages studied.

It is concluded that a successful eco-village is a socially harmonious, economically viable and ecologically sustainable settlement that enables human beings to live co-operatively with each other and with the natural environment. Eco-villages can be splendid settings for community-based environmental education, which changes personal attitudes and behaviours relating to the environment.

This thesis makes an original contribution to the literature of environmental education. Little has been published on the emerging process of community-based environmental education; even less on the educational role of eco-villages. It is believed that no previous empirical study has focused on a comparison of community-based environmental education or indeed a comparison of eco-communities in Sri Lanka and the United Kingdom.

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Chapter 1

Introduction

1.1 Inspiration, aspiration and aims

The author of this thesis acted as a project manager in the Sarvodaya Shramadana Movement, which is a Sri Lankan Non Governmental Organisation (NGO) undertaking community development programmes, all around the country. Within her work in Sarvodaya, she has taken part in an eco-village development project, which is an ecologically friendly resettlement scheme for tsunami affected families. The village serves as an educational site for people to learn about sustainable living and for the delivery of community-based environmental education. Based on this personal experience the author selected to undertake research on this subject for her Master's degree. The thesis explores the role of eco-villages in community-based environmental education and presents a comparative study of eco-communities in Sri Lanka and the UK. A fundamental reason for engaging in this kind of research lies in the author's personal interest in environmental education, particularly within communities. This is seen as both valuable and necessary. Recent concerns about environmental degradation in the world brings to the attention of the public the benefits of working to improve the quality and impact of environmental education. There is growing recognition that sustainable development can be better implemented when it is supported by an educated and informed public. Hence an objective of this thesis is to highlight the need for community-based environmental education and the role that eco-villages can play in the delivery of conservation messages to the public. It is thought that if people take environmental issues as their personal concerns, they will be motivated to improve their pro-environmental behaviours. Indeed, a key outcome of the study as a whole relates to



the 'lived experience' of eco-village residents and a fundamental aim has been to illuminate how such experiences influence knowledge, attitudes and pro-environmental behaviours.

Beyond the personal interest, there are more practical rationales for this study. The author wished to understand what is meant by sustainable communities and what their role is for the future sustainability of the planet. The concept of sustainability is commonly referred to, and this study illuminates how it may be understood in the eco-village context. Furthermore, the study is important because, whilst the UK-based eco-village featured as a case study has been studied by different researchers, the Sri Lanka-based village has not previously been studied, either in terms of sustainability, or its educational provision. This thesis is therefore a valuable resource for the Sri Lankan village of Damniyamgama. It has practical relevance for helping to plan future activities for its long-term commitment to its sustainability.

Although this work focuses on case studies of two eco-villages, it also provides information about other eco-villages around the world and the work of NGOs relevant to community-based environmental education in Sri Lanka and the United Kingdom. It is therefore intended to add to the very limited existing literature on the subject of community-based environmental education and the role of NGOs in this.

Eco-villages are emerging new models for sustainable human culture and act as living experimental laboratories to teach us about sustainable development. They are ideally suited to serve as educational centres for wider communities. They provide environmental, social, spiritual and economic sustainability and enhanced quality of life for all. This thesis discusses the development, management and organisation of such villages in the hope that this may inform and inspire others to engage with the eco-village concept.

In order to undertake effective research, the author of this thesis read and reviewed a substantial quantity of literature that crosses disciplinary boundaries, for example, about global environmental problems, sustainable development, environmental education in general, community-based environmental education, psychological considerations, the role of non-governmental organisations and community-based environmental initiatives and the concept of eco-villages.

Through a combination of literature review and empirical data collection, the author pursued the following research aims:

- To examine how successfully concepts of sustainable development are incorporated within both the named eco-villages.
- To review aspects of the current educational activities in both eco-villages; to identify what roles eco-villages play in the transfer of environmental knowledge, information and ideas to the community, and beyond it.
- To make comparisons between the eco-villages and to identify transferable outcomes that could be implemented elsewhere.
- To identify areas that would benefit from further development in both of the eco-villages studied.

1.2 Thesis organisation

After the study's introduction here in Chapter 1, Chapters 2, 3, 4 and 5 present the literature review findings and demonstrate how previous work is relevant to this study. The methodology and findings of the case studies are presented in Chapters 6, 7 and 8. Finally, Chapter 9 provides a discussion of the findings, conclusions and recommendations.

A brief preview is provided:

Chapter 2 opens with a consideration of global environmental problems and their direct relevance for environmental education. It moves on to consider the definition and development of environmental education and the interface of this with sustainable development. The Chapter examines the development of environmental education, international summits and conferences that have taken place and have reinforced the significance of environmental education. It establishes the background context for community-based environmental education.

Chapter 3 then focuses on community-based environmental education and theoretical considerations pertaining to this. It reviews educational and psychological research on environmental knowledge, attitudes, behaviours and concerns.

Chapter 4 provides a focus on literature relating to the role of Non-Governmental Organisations and community-based environmental initiatives in Sri Lanka and the United Kingdom. Such review was considered helpful in order to understand the community-based environmental education culture and educational delivery and to show what NGOs do in the field of community-based environmental education. The Chapter provides examples from both the Sri Lanka and UK after a general overview of the field.

The literature review of Chapter 5 focuses on the concept of the eco-village. This chapter draws attention to the nature of eco-villages, what they do in the field of environmental education, and examples of eco-villages around the globe.

In Chapter 6 attention turns to the thesis' methodology. The empirical research is focussed on two eco-villages, one in Sri Lanka and one in the UK. This thesis is presented as a research-based case study. The author is inspired about case study theory

by such writers as Robson (2002) and Bryman (2001). The methodology chapter explains the selection of the sample and how data were collected. This entailed formal and informal discussions with the staff members, community members and visitors plus in-depth interviews with six individuals in each village.

Chapters 7 and 8 present the case study data. Chapter 7 focuses on the case study of community-based environmental education in Sri Lanka, namely the Damniyangama eco-village in Kalutara. Chapter 8 presents the case study of community-based environmental education in the United Kingdom, namely the Findhorn eco-village in Scotland. Both chapters explain the major areas under investigation and the findings. These include organisational and village backgrounds, sustainable infrastructure development, village structure and management, the use of an eco-village as a basis for community-based environmental education and strength and challenges.

The discussion, conclusions and recommendations of this thesis are presented in Chapter 9. Comparisons are made between Damniyangama and Findhorn and their similarities and differences are explored in relation to the research literature. The chapter is divided into eight sections corresponding to the areas under investigation. These are:

- Initiation of the villages: commonalities and differences,
- Eco-living and infrastructure,
- Eco-village business and economic sustainability,
- Human relationships,
- Management and decision making,
- Community-based environmental education,
- Links between research findings and literature reviewed for this study.
- Areas for potential development in the eco-village studied,

Finally, this study presents areas for potential development and the conclusion and recommendations draw attention to the constraints of implementing community-based environmental education, the educational role of an eco-village and the need for future research on community-based environmental education.

Chapter 2

Environmental Education: Context, Definition and Development

2.1 Global environmental problems: The context for environmental education

The context for environmental education is of course, the current environmental 'state of the world,' and so it is appropriate to set the scene for introducing the subject of environmental education with a brief overview of some of the many issues and actions adversely affecting our planet today.

Environmental degradation is the result of the dynamic interplay of socio-economic, institutional and technological activities. Environmental changes may be driven by many factors including economic growth, population growth, urbanisation, intensification of agriculture, rising energy use and transportation. Poverty still remains a problem at the root of several environmental problems (The underling causes of environmental degradation <http://indiabudget.nic.in/es98-99/chap1104.pdf>).

Humans have gravely altered the chemistry, biology and physical structure of the earth's land and water. According to the latest findings on the 'human footprint on earth' half of the mangrove forests, which serve as estuaries in the tropics, have been lost to a combination of coastal development and conversion to aquaculture. While protein demands are projected to double in the century ahead, no respected marine biologist expects the oceanic fish catch, which has plateaued over the last decade, to double. The world's oceans are being pushed beyond the breaking point, due to a lethal combination of pollution and over-exploitation. Eleven of the 15 most important oceanic fisheries and nearly 70 percent of the world's major marine fish stocks are over fished or are being fished at their biological limit. Twenty percent of the world's freshwater fish are

extinct threatened or endangered, and more than half the world's coral reefs are now sick or dying. Half of the world's wetlands were lost last century, whilst logging and conversion have shrunk the world's forests by as much as half. The clearing of tropical forests has contributed recently to unprecedented fires across large areas of Southeast Asia, the Amazon, and Central America, and some 9 percent of the world's tree species are at risk of extinction. Tropical deforestation may exceed 130,000 square kilometres per year. Out of 242,000 plant species surveyed by the World Conservation Union in 1997, some 33,000, or 14 percent, are threatened with extinction-mainly as a result of massive land clearing for housing, roads, and industries. Soil degradation has affected two-thirds of the world's agricultural lands in the last 50 years. Dams, diversions or canals fragment almost 60 percent of the world's largest rivers. World energy needs are projected to double in the next several decades, but no credible geologist foresees a doubling of world oil production, which is projected to peak within the next few decades.

(World Population Awareness, 2007 <http://www.overpopulation.org/impact.html>).

Continuous growth of population, unsustainable agriculture, and ever-increasing industrialisation increase the number and gravity of environmental problems in 21st century. According to Swarup and Patra (2005) environmental pollution is a major global problem posing serious risk to human life and animals. It is defined as the human alteration of chemical or physical characteristics of the environment to a degree that is harmful to living organisms. Our lifestyles include cars, fast food, disposable items (for example, paper plates and plastic bags), newspapers, air conditioning, household appliances (for example, microwaves, refrigerators and hairdryers), and many other items that make our lives safer, easier, and more comfortable. Unfortunately, environmental pollution is often a consequence of producing, using, and disposing of these goods.

The rapid pace of urbanisation, industrialisation and indiscriminate and improper use of chemicals such as pesticides and drugs have resulted in increased contamination and degradation of the environment, leading to adverse health effects on living beings and problems associated with residues in food of animal origin. The pollutants in each medium can move to or from any other medium. For example, pollution released to the air can fall to the ground and contaminate soil which can leach into aquifers, which are underground sources of water for communities that get their drinking water from wells. The use of fossil fuels is also responsible for the build-up of 'greenhouse gases' that are a key factor in global warming which is changing weather patterns and raising ocean levels around the world. Pollution is generated by industries, agriculture, businesses, schools, vehicles, and even our homes. If not properly handled, pollution will contaminate our soil, water, and air (Swarup and Patra, 2005).

Industrial agriculture promotes the use of monocultures, rather than a diversity of crops, which impacts upon bio-diversity and land quality. Ten to thirty percent of the mammal and bird species of our planet are currently threatened with extinction, all due to human actions (world population awareness, 2007, <http://www.overpopulation.org/impact.html>). Some 90 percent of all large fishes have disappeared from the world's oceans in the past half century; the devastating result of industrial fishing. Destruction of coral reefs is caused by a combination of factors, including warming of oceans, damage from fishing tools and the harmful infection of coral organisms promoted by ocean pollution. It would take hundreds of thousands of years to restore what is now being destroyed in a few decades in the areas of loss of bio-diversity, deforestation, land degradation, and contamination of water sources and other natural resources.

Furthermore, many avalanches and mud slides in many regions around the world that have claimed many lives, may have been made worse by the clearing of so many forests, which provide a natural barrier that can take the brunt of such forces. The billions of tons of carbon that have been released since the industrial revolution have pushed atmospheric concentrations of carbon dioxide to their highest levels and these continue to rise each year. As scientists predicted, temperatures are rising along with the concentration of carbon dioxide. The latest jump in 1998 left the global temperature at its highest level since record-keeping began in the mid 19th century. Higher temperatures are projected to threaten food supplies in the next century, while more severe storms are likely to cause economic damage whilst rising seas will inundate coastal cities.

(World Population Awareness, 2007 <http://www.overpopulation.org/impact.html>).

The cost to tackle this and the related illnesses, problems and other cascading effects are likely to be significant (Mannion and Bowlby, 1992). Raleigh and Urdal (2006) remind readers that many environmental problems are desperately in need of attention. If action is not taken, climate change is expected to bring about major change in freshwater availability, the productive capacity of soils, and also in patterns of human settlement. For example climate change is likely to influence the food producing capacity in many areas. While some areas may experience a reduction in crop yields, there are currently 1.7 billion people who presently live in countries that are water-stressed, enduring rising of sea levels and increased risks of flooding (Raleigh and Urdal 2006).

As human beings continue to have significant impacts on the environment and its resources, it is important that every individual must possess knowledge of and about environmental issues and must be able to act in order to achieve ecologically sustainable behaviours. Educating both adults and young people is seen as a fundamental aspect of

the solution to such problems. Given this situation, and the already considerable investment in environmental education in schools, the notion of encouraging students to initiate environmental discussions with adults at home and in the community seems attractive and worthy of investigation.

Palmer (1998) suggests that environmental education leads to sustainable development through finding ways to improve people's quality of life without damaging the environment or storing up problems for the future, or transferring them to other parts of the world. A more in depth look at the nature and role of environmental education will be provided later in this chapter, given its fundamental importance in addressing this background of significant global environmental problems. First, a comment on sustainable development and its link to education.

2.2 Sustainable development

Sustainable development has been defined as 'Development that meets the needs of the present without compromising the ability of future generations to meet their own needs'. It contains within it two key concepts: the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organisation on the environment's ability to meet present and the future needs.

(Brundtland Commission, 1987 <http://www.middletownca.com/sustainable-development-definition.htm>).

Education is an essential tool for achieving sustainability. Indeed for many educators and policy makers, the term 'sustainable development education' is used interchangeably or instead of the term 'environmental education'. People around the world recognise that current economic development trends are not sustainable and that public

awareness, education, and training are key to moving society towards a sustainable future.

Education for sustainability in its broadest sense is about empowerment and developing a sense of ownership; improving the capacity of people to address environment and development issues in their own communities. It is about touching people's beliefs and attitudes so that they want to live sustainability, providing sufficient information to support these beliefs, and helping to translate attitudes and values in to action. It should prepare people for the rights and responsibilities of life enabling them to make informed decisions as members of a community and society.

'Education for sustainable development enables people to develop the knowledge, values and skills to participate in decisions to do things individually and collectively, both locally and globally that will improve the quality of life now without damaging the planet for the future' (Palmer and Birch, 2003: 447-460).

'Education for sustainable development aims to develop a critical awareness of the ecological, social, economic and political forces which shape all our lives and of how they contribute to, or work against, quality of life and a sustainable future. It increases understanding of the interdependence of all life on earth, and the consequences of our decisions and actions, both now and in the future'.

(Supporting learning for sustainability, 2006

<http://www.wwflearning.org.UK/wwflearning-home/lfs-programme/esd/what-is-education-for-sustainable-development,608,AR.html>).

To improve sustainable development education, Keating (1993) suggests that nations should seek to

- Make environment and development education available to people of all ages.

- Work environment and development concepts, including those of population, in to all educational programmes, with analyses of the causes of the major issues. There should be an especial emphasis on training decision makers.
- Involve school children in local and regional studies on environmental health, including safe drinking water, sanitation, food and environmental and economic impacts of resource use (Palmer, 1998: 79).

It would seem that education may be the best tool for providing the public with an understanding of the ramifications of their actions and behaviour patterns in order to increase sensitivity of and concern relating to environmental issues. It is also critical for achieving environmental and ethical awareness, promoting values and attitudes, skills and behaviours which are consistent with sustainable development and effective public participation in decision-making. Both formal and non-formal forms of education are indispensable to changing people's attitudes so that they have the capacity to assess and address their personal sustainable development concerns and the needs of the planet. Environmental education is becoming an increasingly important focus for educational research in a school context as well as at community level. In general, environmental education focuses on making people aware of environmental issues and promotes an understanding of the relationship between humans and their surrounding environment. An individual must learn in a formal way to reflect on the implications of his or her actions and act in positive ways that support and enhance the quality of life and the environment. Importantly, in addition, the best way to promote awareness for environmental issues and promote environmentally responsible behaviours is through increased access to environmental education which focuses on sustainability. Education and training which inculcates facts, skills understanding and values would seem to be essential to the achievement of this end and to developing people's ability and willingness to solve environmental and development problems. This must be seen as

part of life long learning process which takes account of the ecological conditions associated with economic, social and cultural development. (Environmental Education and Training in Europe, 2000: 74).

Hence it is to the subject of environmental education that we now turn, and first to the literature relating to its definition and development, theory and examples of some research findings relating to this field.

2.3 Environmental education: aims and principles

Three decades ago, the significance of environmental education was increasingly recognised around the world. Major international organisations such as UNESCO staged multinational conferences and published definitive statements on the subject.

Environmental education is a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action (UNESCO, Tbilisi Declaration, 1977).

Environmental education aims to foster public awareness of and concern about environmental issues, problems and solutions by providing people with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to investigate issues, solve problems and protect and improve the environment (UNESCO, 1977).

For the achievement of its aims, environmental education should take into account the following guiding principles.

- The environment is common heritage of mankind.

- The common duty of maintaining, protecting and improving the quality of the environment, as a contribution to the protection of human health and the safeguarding of the ecological balance.
- The need for a prudent and rational utilisation of natural resources.
- The way in which each individual can, by his own behaviour, particularly as a consumer, contribute to the protection of the environment (Palmer, 1998: 16).

A number of authors have made recommendations for environmental education, for example Palmer (1998):

- Both formal and informal education should use the local and distant environments to provide knowledge, training in appropriate skills and first hand experience.
- Pupils and young people should be introduced to environmental concepts and values, given practice in decision making and afforded opportunities for personal involvement.
- Pupils and young people should be trained to access critically the many views being expressed today on current environmental issues.
- Environmental education should permeate the whole curriculum both inside and outside the school.
- Every school should have adequate arrangements for planning and implementing a programme of environmental education.
- To make environmental education a separate subject is neither desirable nor possible.
- The programme of environmental education begun in primary school and pursued into secondary school should continue into informal education and later life.
- Efforts should be made to coordinate the total programme of lifelong environmental education.

(Palmer, 1998:10)

As a second example, '*Environmental education for a sustainable future: National action plan*' (Australia government, Department of environment and water resource, 2000) identifies a number of principles associated with environmental education. These are:

- Environmental education must involve everyone.

Because of its very nature and importance, environmental education cannot be confined to any one group in our society. It is a responsibility for everyone; government, industry, the media, educational institutions, community groups as well as individuals.

- Environmental education must be life long.

Information about environmental problems is always improving, as we learn from our past experiences and mistakes. As we develop and apply better environmental technologies, the ability of society and individuals to respond effectively also improves. In order to move closer to achieving ecologically sustainable development as a nation, all individuals need to continually refresh the knowledge and skills which they apply to the environmental challenges we face.

- Environmental education must be holistic and about connections.

In order to address environmental challenges, people need to think broadly and understand systems, connections, patterns and causes. Environmental education is enhanced by the opportunity to appreciate and learn from indigenous people's experience, particularly their affinity with the environment in which they lived and continue to live.

- Environmental education must be practical.

One of the most fundamental defining characteristics of effective environmental education is that it must lead to actions which result in better environmental outcomes, not simply the accumulation of inert knowledge or impractical skills.

- Environmental education must be in harmony with social and economic goals and accorded equal priority.

Effective environmental education must also encourage the pursuit of environmental goals in a way that acknowledges other powerful and legitimate social and economic aspects. (Australia government, Department of environment and water resource, Environmental education for a sustainable future: National action plan, 2000 <http://www.environment.gov.au/education/publications/nap/>).

2.4 Development of environmental education: definition and landmark events

Disinger (1983) claims that the first recorded use of the term ‘environmental education’ at an international level was in Paris in 1948, at a meeting of the International Union for Conservation of Nature and Natural resources (IUCN) (Palmer and Neal, 1994: 12).

In 1970 the IUCN held a working meeting on ‘Environmental Education in the School Curriculum’ in Nevada, USA. The deliberations of that conference continue to be a major influence on the development of environmental education. The definition drawn up at this conference is:

‘Environmental education is the process of recognising values and clarifying concept in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture and his biophysical surroundings. Environmental education also entails practice in decision making and self-formulation of a code of behaviour about issues concerning environmental quality’ (IUCN, 1970).

The relationship between economic development and environmental degradation was first placed on the international agenda in 1972, at the United Nations conference on the Human Environment, held in Stockholm. After the conference, governments set up the United Nations Environment Programme (UNEP), which today continues to act as a

global catalyst for action to protect the environment.

(Earth Summit, 1992 <http://www.un.org/geninfo/bp/enviro.html>).

According to Palmer and Neal (1994) the United Nations Conference on the Human and the Environment, held in Stockholm in 1972, stated 'Education in environmental matters for the younger generation as well as adults, giving due consideration to the underprivileged, is essential' (Palmer and Neal, 1994: 12).

The United Nations Educational, Scientific and Cultural Organisation (UNESCO) and the United Nations Environmental Programme (UNEP) established the International Environmental Education Programme (IEEP) in 1975. At a major international workshop held by IEE in 1975 in Belgrade, the aims, objectives, key concepts and guiding principles of environmental education were developed.

Objectives were defined as follows:

- To foster clear awareness of and concern about economic, social, political and ecological interdependence in urban and rural areas.
- To provide every person with opportunities to acquire knowledge, values, attitudes, commitment and skill needed to protect and improve the environment.
- To create new patterns of behaviour of individuals, groups and society as a whole towards the environment (UNESCO, 1975).

In 1980, the World Conservation Strategy was launched and this key document stressed the importance of resource conservation through 'sustainable development', and the idea that conservation and development are mutually interdependent.

In 1987, the World Commission on Environment and Development produced the report on 'Our Common Future' (WCED, 1987). Debate arising from this report led to a

major global conference on Environment and Development, 'The Earth Summit' which was staged in Rio de Janeiro in Brazil in 1992. This conference was entitled the United Nations Conference on Environment and Development. One of the key out come of this conference for educators is the recommendation that environmental and development education should be incorporated as an essential part of learning, within both formal and non formal education sectors (Palmer and Neal, 1994: 15).

Arising out of this event was the ' Rio Declaration', a set of 27 principles covering environmental protection and responsible development. These principles build on ideas from the Stockholm Declaration at the 1972 United Nations Conference on the Human Environment. One of the principles is 'Environmental issues are best handled with participation of all concerned citizens, at the relevant level'. At the national level, each individual should have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. Nations should facilitate and encourage public awareness and participation by making information widely available.

(United Nations Environment Programme, Environment for Development

<http://www.unep.org/Documents.multilingual/Default.asp?DocumentID=78&ArticleID=1163>).

The United Nations Conference on Environment and Development (UNCED) of 1992 agreed to a global environment and development agenda for the twenty-first century, known as Agenda 21. According to Agenda 21, 'education, including formal education, public awareness and training, should be recognised as a process by which human beings and societies can reach their fullest potential. Education is critical for promoting sustainable development and improving the capacity of people to address environment and development issues'. It recognises that environmental education and

communication can be used to help people become aware of the consequences of their actions, provide information to help solve environmental problems, and build the human capacity necessary to prevent and solve environmental problems (Sonneborn, 2001, in Salequzzaman and Stocker, 2001: 104-127).

A major theme of Agenda 21 is the need to eradicate poverty by giving poor people more access to the resources they need to live sustainably. Agenda 21 explains that population, consumption and technology are the primary driving forces of environmental change. It lays out what needs to be done to reduce wasteful and inefficient consumption patterns in some parts of the world while encouraging increased but sustainable development in others. It offers policies and programmes to achieve a sustainable balance between consumption, population and the Earth's life-supporting capacity. It describes some of the technologies and techniques that need to be developed to provide for human needs while carefully managing natural resources. Agenda 21 provides options for combating degradation of the land, air and water, conserving forests and the diversity of species of life. It deals with poverty and excessive consumption, health and education, cities and farmers. There are roles for everyone: governments, business people, trade unions, scientists, teachers, indigenous people, women, youth and children. It says that 'sustainable development is the way to reverse both poverty and environmental destruction'. By adopting Agenda 21, industrialised countries recognised that they have a greater role in cleaning up the environment than poor nations, who produce relatively less pollution. The Agenda makes it clear that sustainable development is primarily the responsibility of governments, and this will require national strategies, plans and policies. The efforts of nations need to be linked by international co-operation through such organisations as the United Nations. The broadest public participation and the active involvement of the non-governmental organisations and other groups should also be encouraged. Agenda 21 consists of 40

chapters in four sections of overlapping and interrelated issues involved in sustainable development. A summary of the four sections follows:

- Social and economic dimensions:- developing countries, poverty, consumption patterns, population; health, human settlements, integrating environment and development.
- Conservation and management of resources:- atmosphere, land, forests, deserts, mountains, agriculture, biodiversity, biotechnology, oceans, fresh water, toxic chemicals, hazardous radioactive and solid waste and sewage.
- Strengthening the role of major groups:- women, children and youth, indigenous people, non-governmental organisations, local authorities, workers, business and industry, farmers, scientists and technologists.
- Means of implementation:- finance, technology transfer, science, education, capacity-building, international institutions, legal measures, information.

Without doubt, the role of individuals and of the education of communities, supported at national level, lie at the heart of this flagship document (Rio Declaration on Environment and Development <http://www.iisd.org/rio+5/agenda/agenda21.htm>).

The World Summit on Sustainable Development, (WSSD) or Earth Summit 2002 took place in Johannesburg, South Africa in 2002. This meeting was convened by the United Nations to discuss sustainable development. WSSD gathered a number of leaders from business and non-governmental organisations, ten years after the first Earth Summit in Rio de Janeiro. The Johannesburg Declaration (Declaration of the World Summit on Sustainable Development) builds on the earlier declarations made at Stockholm in 1972, and Rio 1992. While committing the nations of the world to sustainable development, the declaration also states that 'education is critical for promoting sustainable

development and improving the capacity of the people to address environment and development issues'. (Earth summit, 2002

http://en.wikipedia.org/wiki/World_Summit_on_Sustainable_Development)

Since 2000, the governments of the world, together with agencies of the United Nations, have launched four key environmental initiatives, all of which focus on education in one way or another. These are: The Millennium Development Goals (MDGs) – eight goals with a target date of 2015, Education for All (EFA) – six goals also with a target date of 2015, The United Nations Literacy Decade (UNLD) – from 2003 to 2012, and The United Nations Decade of Education for Sustainable Development (DESD) – from 2005 to 2014. The DESD is intended to promote education for sustainable development by: making people aware that education is a good basis for a sustainable way of life; making sure that ideas about sustainable development are part of schools, colleges, universities and other ways of learning; and making sure that organisations and governments worldwide work together, so that they can learn from new experiences and from activities in different parts of the world.

(UNESCO, 2005 <http://unesdoc.unesco.org/images/0014/001408/140848m.pdf>).

The above information has identified a number of important and significant documents in the history of environmental education, deriving mainly from international conferences organised or sponsored by the United Nations organisation. Education is the foundation of sustainable development, as world leaders asserted at the first Earth Summit in Rio de Janeiro in 1992. Ten years on, at the Earth Summit in Johannesburg, the importance of education was reaffirmed, and as stated, the ten year period from 2005 was declared the UN Decade of Education for Sustainable Development. The United Nations Educational, Social and Cultural Organisation (UNESCO) was charged with making the commitment a reality, and is now working on an international

implementation scheme. Environmental education, together with sound legislation, sustainable management, and responsible actions by individuals and communities has been identified as a vital component of an effective policy framework for protecting and managing the environment. In 2007 we hear of a focus on environmental ‘literacy’; learning about and caring for the total environment; understanding how humans interact with and are dependent on natural ecosystems, and developing critical-thinking skills to resolve environmental issues.

As people learn about the environment, they often progress through different stages of understanding: awareness, knowledge, skills, values, and participation. It may be concluded that environmental education is essential to developing a healthy, sustainable society. In recent years environmental education has assumed a new focus on education for sustainability as discussed in section 2.2 of this chapter. It is agreed that simply raising awareness of issues is insufficient to bring about change. Education for sustainability must strongly promote the need for personal initiatives and public participation in order to bring about a sustainable future.

This thesis now turns attention to community-based environmental education; its nature, theoretical consideration and related research. This crucial aspect of environmental education underpins the effectiveness of the case studies that have been researched for this thesis.

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Chapter 3

Community-Based Environmental Education: its Nature and Theoretical Considerations

3.1 Background

Community-based education is not a new idea. It has been more commonly applied with reference to community economic development, housing, youth, and health issues rather than with environmental concerns. Community-based education means more than 'education based in the community'. It implies an education plan created as a result of community involvement and designed to match community interests. It can be argued that involvement of members of a local community in environmental education is extremely important, primarily due to the fact that environmental problems and solutions have their roots in local activities and required public assistance to rectify them (Liffery and Eckerberg, 1998, in Polistina, 2005). Local activities impact significantly upon quality of the local environment and community members should have a common interest in protecting and improving their community's quality of life. Hence it can be argued that it is essential that local communities are actively engaged with environmental education at community level.

The term community-based environmental education encompasses several needs. Firstly, it should aim to ensure that environmental education has an obvious connection to the community. Secondly, it should emphasise the link between local activities and a quality environment, and thirdly, it should ensure that environmental education is relevant to people's lives (Entine, 1998).

The goals of community-based environmental education; linked to effective management of the community, are to:

- Expand the community's ability to improve environmental quality.
- Integrate environmental management goals with other community development activities.
- Lead to actual environmental development.
- Increase involvement of more community interest in community environmental management activities (Entine, 1998).

Good community-based environmental education has four key qualities. These are that the activities are community-based, collaborative, information based, and action oriented:

- **Community-based:** Effective community-based environmental education is created in response to local concerns and builds on local strengths.
- **Collaborative:** Community-based environmental education programmes are collaborative; working with coalitions or groups. Leaders attend as much to process as to outcomes. Collaboration requires active, consistent, continuing leadership.
- **Information based:** Community-based environmental education programmes promote action based on information, within the context of community goals. They are integrated into a community planning process and help strengthen citizens' skills to plan with the environment in mind.
- **Action oriented:** The desired outcome is informed action which leads to lasting change (Entine, 1998).

A major theme in environmental education generally is going beyond the classroom and school children, inviting different generations to take part, and calling upon the wider community to participate in activities and actions (Ballantyne, Fien and Packer, 2001). Environmental lifelong education becomes a process focused on the empowerment of people and communities in relationship to a changing environment. In our modern 21st century world, it is of ever increasing relevance. It is becoming more relevant to modern humans. Active citizenship nowadays requires sustainable environmental learning (Belanger, 2003, in Tali Tal, 2004). The 'community school' approach encourages a continuous collaboration between schools and communities on a wide basis, encompassing all parts of school life. In community schools, students, families, and community residents work as equal partners with schools and community organisations to develop programmes (Tali Tal, 2004: 524-541).

3.2 Theoretical considerations and related research

Community-based environmental education is important for achieving community flexibility and responsiveness to environmental issues. The 'community' of the community-based environmental education model can be described as a community in a place; a community of identity; or a community of interest. In each situation, the intent is to build the skills of citizens to gather, analyse, and apply information for the purpose of making environmental management decisions. Community-based environmental education can be described as a process of changing the community's idea of acceptable environmental management behaviour, as a result of direct involvement of citizens in the management process' (Andrews, Stevens and Wise, 2002).

The model, termed community-based environmental education, differs from traditional education in that the educational activities not only build individual knowledge and skills, but also help to build an infrastructure for change that is suitable, equitable and

empowering. In community-based education facilitators work in collaboration with the community to choose a strategy; to consider how and when the strategy could be used; and to guide whether the strategy is applied alone or in combination with others. Warburton (1995) identified the benefits of community participation projects, such as use of local materials, methods and labour, local fundraising and business involvement. He recognised the potential for constant appraisal of projects, potential to change attitudes, influence the behaviour of participants and also for raising local political support. According to Warburton, a key advantage in community participation in conservation projects is developing a people-place relationship that arises when people become interested in local environmental issues.

Community-based environmental education integrates information dissemination, traditional education, participatory decision making, and other tools used in communication/diffusion approaches. Such education supports learning theory, which maintains that individuals are not motivated to learn unless the information is relevant to their lives and they have a sense of control about the learning process (Carlson and Maxa, 1997, in Andrews, Stevens and Wise, 2002). For education to take place, the individual has to actively receive the knowledge and know what to do with it and the facilitators job is to provide the education in a way or at a time when the individual is receptive and to assure that the individual knows what to do with the knowledge. Then, the individual can find appropriate information and techniques in his previous experience to bring to bear on new problems and situations.

Community-based environmental education integrates basic learning skills with innovative diffusion approaches to create an education process focused on an individual's natural and socio-cultural environment. Four themes of environmental

education literacy have been incorporated in to the community-based environmental education model. These are:

- Knowledge of environmental process and systems
- Questioning and analysis skills
- Skills for understanding and addressing environmental issues and
- Personal and civic responsibility (Simmons, 1999, in Andrews, Stevens and Wise, 2002)

Education programmes that have been developed according to the ‘community model’ rely on informal learning, learning through activities that occur outside formal education settings and that are characterised as voluntary. Zelezny (1999) suggests that intervention in non-traditional settings more often involves adult participants compared with those in class room settings. Crane (1994) suggests that informal learning experiences within communities can be structured to meet a stated set of objectives and can be designed to influence attitudes, convey information, and/or change behaviour. (Crane 1994, in Andrews, Stevens and Wise, 2002)

Andrews, Stevens and Wise (2002) have established that in a community-based education model, a community:

- has or establishes a vision and goal.
- inspires an instigator who, stimulated by these goals, enlists or gathers a group or coalition to start an initiative and keep it going.
- supports group activities to gather and analyse information.
- engages the larger community in carrying out what it has learned through policy changes, new regulations, and/or education.

These authors suggest that people embarking on community-based environmental education should consider:

- When is education an important element of environmental decision making?
- What types of education needs are best supported?
- Who are the people who can assure that this complicated process can be carried out?
- How can the effectiveness of the process be evaluated?
- How can it be applied to larger scale problems?

(Andrews, Stevens and Wise, 2002)

Given this context, this chapter now turns attention to aspects of educational and psychological research which underpin and are relevant to community-based educational endeavours. The examples selected from an extensive literature review of environmental learning, attitudes and concerns are those which have perceived relevance to the case studies of eco-villages documented in Chapters 7 and 8.

As previously discussed, concerns about global environmental issues often focus on education as the key to improving environmental behaviour (Disinger, 1982). Most environmental psychologists and educators believe that environmental education is linked to the need to engage in appropriate environmental behaviour (Borden, 1984-1985, in Leeming and his colleagues, 1993). Alongside this positive stance, critics of environmental education have argued that few environmental education interventions actually encourage responsible environmental behaviour (Volk, Hungerford and Tomera, 1984). However there is a commonly held assumption that education leads to greater awareness and attitude change, which ultimately improves environmental behaviour (Bruvold, 1973). Hence the primary goal of community-based environmental

education should be to encourage people to engage in more pro-environmental behaviours (Leeming, Dwyer, Porter and Cobern, 1993: 8).

Stern (1992) has suggested that besides technical solutions, psychological predispositions are also needed for overcoming environmental challenges. Kals (1996) relates the significance of responsibility as a promising predictor of ecological behaviour (Kals, 1996). Kaiser (1996) indicates that people can feel responsible in at least two ways: one way refers to morality and the other to conformity to social expectations or conventions. While moral responsibility feelings are related to moral concepts such as the welfare, rights of others, and fairness considerations, conventional responsibility feelings are grounded in social customs or traditions and are linked to community well-being.

Studies have pointed out the importance of empathy in improving attitudes toward the environment (Shelton and Rogers, 1981). They have predicted that higher levels of empathy would improve environmental attitudes and behaviours. Empathy refers to an 'emotional response congruent with the perceived welfare of another'. Several studies suggest that inducing empathy may be a potent technique for creating more responsible environmental attitudes. Shelton and Rogers (1981) undertook research to highlight the relationship between empathy and environmental attitudes. Participants viewed films of industrial whaling and a pro-environmental action organisation attempting to save whales. Participants were asked to report their mood and attitudes toward saving whales. Positive attitudes toward saving whales were found. It may be that empathy for the environment emerged as a result of viewing films evoking a need to protect it. These results suggest that it may be possible for empathy to be generated with regard to the environment and that community-based environmental education can play a major role in this (Shelton and Rogers, 1981).

Kraus (1995) determined that one of the most important determinants of behaviour is attitude; but it has also been found that giving environmental knowledge on environmental issues does not necessarily foster positive environmental attitudes (Eagly and Kulesa, 1997, in Pooley and O'Connor, 2000). It has been suggested that the key entry point for environmental education is via the affective domain (Iozzi, 1989a). This argument stems from a learning model presented by Eiss and Harbeck (1969, in Iozzi 1989b) indicating that an individual's response to the environment is based on three domains: affective, cognitive, and behavioural. Iozzi (1984, in Iozzi 1989b) concludes that further environmental education studies should address the affective (which he terms attitude) domain rather than just rely on cognition (knowledge) as this is not sufficient to produce changes in attitude and thus behaviour (Iozzi, 1989a). Attitude has been defined as referring to a 'psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour' (Eagly and Chaiken, 1993). The results of the study undertaken by Pooley and Conner (2000) support the notion that environmental attitudes may be based on different sources of information, and therefore attitudes toward specific environmental issues may be predicted by both cognition (knowledge) and affect (emotions or feelings).

Borden and Schettino (1979) consider three elements of the development of 'pro-environmental disposition': knowledge, attitudes (or emotion or feelings) and action. These three components are referred to as cognitive, affective and conative. Borden and Schettino propose that these components relate to each other in such a way that behaviour constituting positive action in or for the environment is considered to be a product of positive feelings or attitudes. They found that knowledge of the environment is not a necessary condition for individual environmental action and it is concluded that attitudes and knowledge are not related whilst the action relation with their environment is influenced by both cognitive and affective elements.

A contradictory position explained by Hines (1987) is that lack of knowledge is a factor that can explain the weak relationship between environmental concern and environmentally responsible behaviour. Hines (1987) and Simmons and Widmar (1990) concluded, for example, that lack of knowledge was a substantial barrier to recycling amongst people with positive conservation attitudes (in Fransson and Garling, 1999).

Dunlap and Van Liere (1984) conclude that environmental concern is dependent on various specific attitudes and personal norms concerning environmental issues. Similarly Takala (1991) claims that environmental concern has been treated as an evaluation of, or an attitude towards facts, one's own behaviour, or others' behaviour with consequences for the environment. This suggests that environmental concern may refer to both a specific attitude directly determining intentions, or more broadly to a general attitude or value orientation. Stern (1992) identified four different such value orientations. In the first of these, environmental concern represents a new way of thinking called the New Environmental Paradigm (NEP) (Dunlap and Van Liere, 1978). In a second value orientation, environmental concern is tied to anthropocentric altruism; people care about environmental quality mainly because they believe that a degraded environment poses a threat to people's health. Thus, it is not the threat to the environment, but the threat to the wellbeing of people that is of central concern (Van Liere and Dunlap, 1978). According to a third value orientation, environmental concern expresses self interest. For example, Baldassare and Katz (1992) found that perceived personal threats caused by environmental deterioration are an important factor underlying environmentally responsible behaviour. Finally, Stern (1992) assumes that environmental concern is a function of some deeper cause, such as underlying religious beliefs or post materialistic values.

Turning to pro-environmental attitudes; Meinhold and Malkus (2005) demonstrate that adolescents who show greater levels of pro-environmental attitudes would demonstrate greater levels of pro-environmental behaviours compared to those adolescents who have lower pro-environmental attitudes. When adolescents demonstrate more pro-environmental attitudes and knowledge, their participation in pro-environmental behaviours increases. According to Polistina (2005) pro-environmental knowledge, values and attitudes are held by people who view the natural environment as having intrinsic value over and above the use of it by humans. Its preservation and conservation is valued as an essential requirement to quality of life, and it is seen as finite. A person who has or is developing a strong spiritual connection with the natural environment would hold these values and attitudes.

However, Axelrod and Lehman (1993) conclude that an attitude of concern about the environment is not sufficient to predict action. For these researchers, action is purported to be dependent upon not just one but on a number of factors such as an individual's feelings towards the environmental issues (an 'attitudinal factor'), or individual's knowledge and ability to act in line with his or her attitude (an 'efficacy factor'). Thirdly, action may be affected by an individual's desire for an outcome from that action (an 'outcome desire').

Hines (1987, in Fransson and Garling, 1999) provides an explanation for why environmental concern shows low correlations with actual behaviour. This is that social norms prevent individuals from acting in accordance with their attitudes. In some circumstances, it may not be socially acceptable to behave in ways which are environmentally responsible. A telling example is of an individual with negative feelings about wasting water for flush toilets in Sri Lanka, but is prevented from using compost toilets because it is socially unacceptable. On the other hand it was found that

the importance of others recycling behaviour is also likely to be significant in increasing individual recycling rates. Fishbein and Ajzen (1975) claim that behaviour is likely to be modified when individuals are aware of a given social norm and, more crucially, accept this norm. Oskamp (1991, in Fransson and Garling, 1999) found that the degree to which respondents acknowledged neighbours recycling behaviour was important in shaping recycling behaviour. In other contexts, Ajzen and Fishbein (1977, in Fransson and Garling, 1999) have demonstrated that attitudes predict behaviour better when no strong norms exist dictating how to behave.

A contradictory argument is made by Hopper and Nielsen (1991) in their study. They write that social norms had no independent effect on behaviour, but are completely mediated through personal norms. A norm is defined as an expectation held by an individual about how he or she ought to act in a particular social situation. Stern (1992) concludes that a personality factor that has been found to consistently correlate with environmentally responsible behaviour is 'locus of control'. Researchers have differentiated between individuals with an internal locus of control (individuals who perceive that their own behaviour makes a difference) and individuals with an external locus of control (individuals who perceive that changes are due to random events or the behaviour of other more influential individuals). In this regard, Hines (1987) suggests that individuals with an internal locus of control more often behaved in an environmentally responsible manner than did individuals with an external locus of control. Such results suggest that campaigns to promote environmentally responsible behaviour should convey the message that people's actions make a difference.

Similarly, with reference to the concept of motivation, De Young (1986) has argued that intrinsic motivation to act is an important predictor of environmental and waste management behaviour. 'Intrinsic motivation is evident when people engage in an activity for its own sake, without some obvious external incentive present'. Analysing a

number of personality traits, such as feeling good about recycling and the extent to which people gained satisfaction from acting frugally, he argued that a primary motivator and maintainer of appropriate environmental behaviour was the intrinsic motivation to act. As an example De Young argued that extrinsic motivation was less likely to lead to a long- term increase in recycling behaviour. 'Extrinsic motivation is external to, or outside of, the individual'. A related statement made by Hopper and Nielsen (1991) in their research is that those who believed that their actions would make a difference to the waste problem were those who were more likely to act.

A number of studies have investigated the relation between socio-demographic factors and differences in opinion about and attitudes toward the environment. Van Liere and Dunlap (1980, in Fransson and Garling, 1999) proposed hypotheses to illustrate a relation between socio-demographic factors. The age hypothesis states that younger persons are more concerned about environmental deterioration than older persons and the social class hypothesis states that environmental concern is positively associated with education and income. This research suggests that environmental concern is positively associated with social class as indicated by education, income, and occupational prestige. One explanation for this hypothesis is that the upper and middle classes have solved their basic material needs and thus are free to focus on the more aesthetic aspects of human existence. This hypothesis rests on Maslow's (1970, in Fransson and Garling, 1999) hierarchy of needs theory, and assumes that concern for environmental quality is something of a luxury which can be indulged only after more basic material needs (adequate food, shelter, and economic security) are met. Morrison (1972, in Van Liere and Dunlap, 1980) presents a related argument, using the concept of relative deprivation. He argues that members of the lower class typically have experienced only poor physical conditions, and thus are less aware that they live, work, and play in polluted, overcrowded conditions. Conversely, the middle and upper classes

are more likely to have experienced pleasant residential, work, and recreational environments, and consequently are more concerned about the deterioration of the physical environment. The residence hypothesis describes urban residents as being more likely to be environmentally concerned than rural residents. Tremblay and Dunlap (1978, in Van Liere and Dunlap, 1980) discuss two possible explanations for this relationship. First, urban residents should be more concerned with environmental problems because they generally are exposed to higher levels of pollution and other types of environmental deterioration; this explanation assumes that exposure to poor environmental conditions leads to environmental concern. Second, rural residents are more likely than urbanites to have a utilitarian orientation toward the natural environment because of their involvement with 'extractive' occupations such as farming, logging, and mining. Thus, heavy dependence on use of the natural environment by rural residents is assumed to result in less concern with environmental protection than urban communities. (Van liere and Dunlap, 1980: 181-197).

Gender differences have seldom been investigated. In one study, Arcury and Christianson (1990, in Birch, 2003) found that men were more environmentally concerned than women. Later research by Stern and colleges (1995, in Fransson and Garling, 1999) found, that women differed from men in that they expressed stronger intentions for pro-environmental action and had stronger beliefs about the detrimental consequences of environmental degradation. Similarly a number of researchers have identified that men tend to emphasise mastering nature and deriving benefits from natural resources, whereas women take a more emotional attitude toward nature (Kellert and Berry, 1987, in Fransson and Garling, 1999).

Furthermore, research has shown that environmentally responsible behaviour is influenced by various factors, such as knowledge (Stern, 1992) environmental or

personal responsibility (Van Liere and Dunlap, 1978) verbal commitment (Hines, 1987) and perceived health threats (Baldassare and Katz, 1992).

A number of researchers have proposed models to explain how environmental concern is related to knowledge and actions. A model proposed by Hines (1987) suggests that intention is the factor most closely related to actual behaviour. He further suggests that intention is related to knowledge, skill, and personality. Knowledge is partitioned into two components, knowledge of the existence of the problem, similar to environmental concern, and knowledge of behavioural strategies and their effectiveness. Skill refers to the ability to apply such knowledge to specific problems. Skill is, however, not in itself sufficient for appropriate behaviour. The individual must also desire to do the 'right' thing. This desire is assumed to be influenced by perceived locus of control, attitude, and personal responsibility. If a person has the necessary skill, an internal locus of control, a positive attitude towards the environment, and responsible environmental behaviours, as well as a feeling of personal responsibility, he or she is likely to engage in environmentally responsible behaviour. In the Hines model it is assumed that situational factors also affect responsible environmental behaviours. Examples of situational factors are economic constraints, social pressure, and opportunities to choose alternative behaviours.

Stern and Dietz (1994) assume that people's attitudes and beliefs can be change by educating and providing them with information. They propose that people will feel responsible for environmental action when they are aware of severe consequences (for themselves, other people or nonhuman species) and when they judge themselves to be responsible for the outcomes. A number of researchers incorporate a notion of efficacy or personal control in their model to point out that individuals' beliefs about what they can do, are also an important predictor of behaviour in general. Specifically, these

models suggest that perception of a connection between one's actions and environmental degradation and the belief one can bring about a change are positively associated with environmental activities. Correspondingly, some studies have shown that individuals are more likely to engage in environmental behaviour when they believe that they have the capability to help solve environmental problems through their behaviour

Ronis (1989) claims that everyday behaviour with a negative consequence for the environment becomes habitual. Dahlstrand and Biel (1997) proposed a model specifying how a 'habit' changes into another new, possibly environmentally friendly behaviour, and how this new behaviour then becomes habitual.

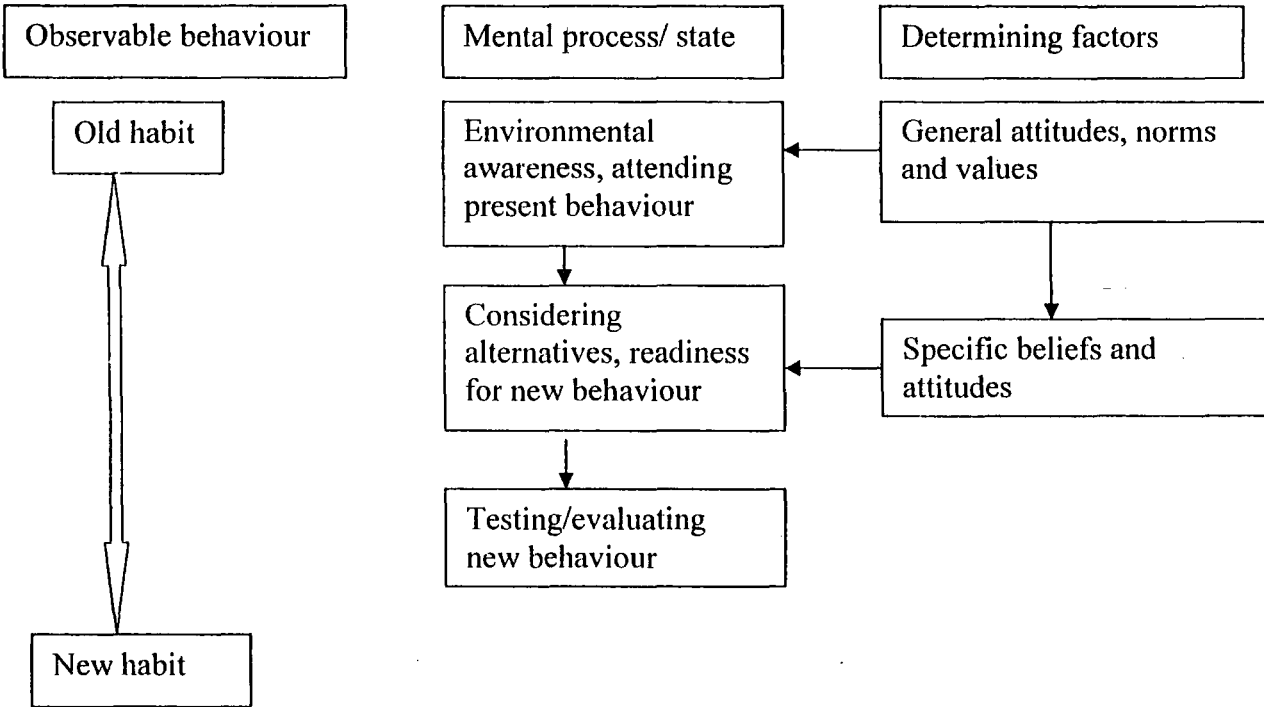


Figure 3.1. Phases, stages, and determining factors of the process leading to the establishment of a new (environmentally friendly) habit. (Dahlstrand and Biel, 1997)

As Figure 3.1 shows, each phase consists of several stages. The figure also displays some of the factors that are assumed to affect the transitions from one phase to another. It should be understood that it is not necessary to go through each stage in order to establish a new habit, although it is assumed that the number of stages and the

likelihood of behavioural change are positively correlated. In a first stage, environmental concern or awareness develops. Environmental concern is in a second stage linked to the old habit, that is, attention is focused on the current behaviour. If such a link is not established, the individual will most likely continue to automatically execute the old habit. The primary determining factors in this phase are values, general attitudes, and norms about the environment. These factors are assumed to influence more specific beliefs and attitudes about alternative behaviours. The specific beliefs and attitudes, in turn, exert their primary influence in the second phase where alternative behaviours are deliberated. This influence leads to a readiness to substitute the old habit with a new behaviour. Trying the new behaviour and evaluating the consequences then follow. Either a new habit is thus established or the old habit persists, depending on the evaluation of the consequences. Dahlstrand and Biel (1997) research results support the model in that the different factors seemed to be effective at separate phases of the process. Thus, the results showed that people in an early phase of the process were more influenced by general environmental values, while people in a later phase were more influenced by specific beliefs.

A crucial research question is how people become environmentally concerned and, accordingly, motivated to behave in an environmentally responsible manner. Hines (1987) investigated different strategies to increase environmentally responsible behaviour, such as delivering knowledge about environmental problems, discussion about alternative solutions to such problems, development of problem analysis and problem solving ability, value discussions, and skill training.

Such psychological research and theory is highly relevant to the design and implementation of effect programmes of environmental education. Clear links can be established with community participation.

Values, situational characteristics, and psychological factors all play a significant role in pro-environmental behaviour in community settings. Results of a study in the UK by Barr (2007) found that an awareness of policy knowledge, in particular the awareness of sustainable development and Local Agenda 21, appears to result in enhanced waste reduction behaviour, implying that a wider knowledge base enhances action. Furthermore it was found that such fundamental values and knowledge can only be changed in the long term by awareness campaigns. In terms of the psychological variables, Barr established that concern about waste issues appears to be important in predicting an intention to reduce, implying that concern-based variables do have importance, at least in raising the willingness of people to act. However, a crucial factor is perceptions of the waste problem and its threat to personal welfare to the self, along with the citizenship factor. Hence, a strong value and knowledge base enhanced waste reduction behaviour. People with strong environmental values and citizenship values, along with good awareness of the waste problem, were more likely to be willing to, and reportedly did, reduce their waste. Furthermore those who feel that their actions are worthwhile and that they gain some satisfaction from reusing materials, were more likely to do so.

Austin (1993) emphasises that public information is one of the most widely used means to promote pro-environmental behaviour change. Information helps to give practical advice, and increase problem awareness, which in turn can affect behaviour (Vining and Ebreo, 1992). It can also inform people about others' efforts, which may increase cooperation (Messick and Brewer, 1983). As an example Weenig and Midden (1991) studied whether decisions to adopt energy saving appliances in the home could be stimulated by information spread through social interaction in neighbourhoods. It appeared that adoption decisions were markedly influenced by the informal advice of neighbours who were friends, that is, persons whose opinion the adopters considered

relevant and reliable. Hopper and Nielsen (1991) investigated the impact of social interaction to change group standards, or social norms, on recycling behaviour. More specifically, they studied a 'block leader approach' by identifying a person living in the neighbourhood who personally informed people in the neighbourhood about the program and actively encouraged them to recycle. It was found that the block leader condition was more effective for increasing the recycling behaviour. Thus, recycling appeared to increase partly as a result of increasing social and personal norms toward recycling. Hence some evidence points to the positive influence of face-to-face interaction regarding pro-environmental behaviour.

Catton and Dunlap (1978, in Uzzell, 2000) maintain that individuals only see the environment in terms of what is immediate and local. Slovic et al (1978) found that the difficulty faced by governments and environmental groups who wish to raise public awareness of the seriousness of global environmental problems and, more importantly, to do something about them is that most global environmental problems such as the destruction of the ozone layer and global warming are regarded as impersonal, indirect and long term. Vining and Ebro (1992) assert that it is worthwhile to educate the people, because people display difficulties in understanding and assimilating complex, distant problems. Zube (1991) suggests that it is crucial to study how people perceive and interact with the environment at a local level because it is at this level that people function and exist in the most meaningful ways. Zube (1991) argues that communication of information about environmental problems should be at the local level that is meaningful to the public. Woolnough's (1993, in Birch, 2003) experience of community programmes is that they highlight communities' lack of interest in many nature conservation issues, such as biodiversity. To overcome this obstacle he suggests the implementation of traditional conservation strategies and improvement of communication skills in order to make biodiversity relevant to local communities.

Actions as well as activities are of great importance at the level of encouraging appropriate behaviours. For example, in the study of problems connected with fertiliser consumption in agriculture, investigating the amount of nitrate in drinking water may be characterised not as an action, but rather as an activity. An example incorporating the action perspective in this sphere would be to explore ways of promoting products from organic agriculture or boycotting products from conventional agriculture and in this way aim at solving the problems of nitrate pollution (Jensen 1991, in Bögeholz, 2006). In other words, an action must be targeted towards solutions of the problem that is being focused upon.

In his research Bögeholz (2006) suggested that environmental actions can be grouped into two main categories: (i) actions which directly contribute to solving the environmental problem that is being worked on: (ii) actions whose purpose is to influence others to do something to contribute to solving the environmental problem (indirect environmental actions). In other words, indirect actions are characterised as dealing with 'people to people' relations, while direct actions refer to relations between people and their environment. Examples of direct environmental actions include sorting of garbage, construction of compost heaps, economising on water and energy consumption. Examples of indirect environmental actions include the preparation and distribution of a newspaper concerning the protection of the environment, writing letters to politicians and companies, organising debate evenings on environmental matters and contributing articles to the media. Collective actions are both important and necessary if change is to be accomplished.

Research has demonstrated that even young people are aware of the necessity of acting together. For example, in answer to a question about whether one can do anything about the problem of over-packaging, a girl from a 4th grade class replied:

“Yes, if many people think of it—we could use less packaging—if there were many people, we could tell it to the local government and then may be they could do something about it.” (Jensen and Schnack 2006, in Bögeholz, 2006).

This is a finding linked to the important field of research on intergeneration influence; to which we now turn.

While there is a strong argument for the need to educate tomorrow’s environmental stewards to undertake actions supporting sustainable practice, many environmental problems are desperately in need of more immediate attention. Indeed it is students’ parents and other adults in our present day communities who have the immediate power to influence prevailing environmental policies and practices (Sutherland and Ham, 1992, in Ballantyne, Fien, and Packer, 2001). Brother (1990, in Ballantyne, Fien, and Packer, 2001) explains that educating adults is, in many instances, problematic or far from easy. There are formidable barriers to the initiation and achievement of the goals of community environmental education programmes. Such barriers include the size and geographical distribution of the goals of community education audience, participants’ lack of time for involvement, lack of funding and resources, and the need to develop appropriate adult communication methods relevant to environmental education. Accordingly, few community programmes exist and most adults gain their environmental education and awareness from the media which, although effective in influencing levels of environmental knowledge, is not generally successful in influencing environmental actions (Finger, 1993, in Ballantyne, Fien, and Packer, 2001).

One of the greatest sources of motivation for undertaking action for the environment is the desire to protect it for the sake of future generations (Ballantyne, 1995, in Ballantyne., Fien and Packer 2001). Therefore, it is contended that the process of

intergenerational influence whereby school students act as catalysts of environmental change among their parents and other community members could be a powerful but, as yet, untapped means of addressing current environmental problems. To achieve this, school environmental education programmes could arguably be designed to help students become competent and motivated to act responsibly on behalf of the environment and, consequently to encourage them to share their informed views and skills with others in their home and community. These are the democratic capabilities of environmental citizenship (Jensen., Kofoed, Uhrenholdt and Vognsen, 1995, in Ballantyne, Fien and Packer 2001).

Possible advantages of promoting intergenerational interaction and communication about environmental issues include the strengthening of links between student environmental learning and action; exposing adults to environmental information and actions in community settings which result from school education programmes. Such advantages extend to empowering students in relation to environmental decision making and action in their homes and community, and supporting families and communities through an emphasis on their active involvement. Intergenerational activity is viewed as any activity or educational programme that brings young and old together for their mutual benefit (Angelis, 1990, in Ballantyne, Fien and Packer 2001). In the field of education, studies concerned with intergenerational interaction have most commonly focused on the development of activities and programmes that allow students opportunities to interact and learn with adults within the school environment.

However it should be noted that Vars and Vars (1990, in Ballantyne, Fien and Packer, 2001) describe some environmental education programmes which emphasise the importance of students, parents and community members actively interacting in outdoor

learning and which have actually failed to result in effective learning (Ballantyne, Connell and Fien, 2006: 413-427).

Finally, attention is drawn to literature on what might be described as 'free-choice environmental learning' where programmes are provided in settings in which people are likely to enjoy the thrill of discovery. Such settings may include museums, zoos, nature centres, field trips and so on and learning within them may lead to taking pro-environmental actions. Learning in such settings is voluntary, often socially mediated and stimulated by the needs and interest of the learner-so could well be in a community-based setting. Miles (1991, in Kola-Olusanya, 2005) suggests that informal environmental learning settings can be used to provide opportunities for intrinsic and self-motivated learning experiences with the goal of developing positive relationships with and understanding of the environment. In turn, desire to take action to protect it will follow.

Having explored the nature of community-based environmental education, various theoretical perspectives, and existing relevant research drawn from the fields of psychology and education, attention now turns to the delivery of community-based environmental education. In particular, the role of Non-Governmental Organisations in promoting community-based initiatives is explored. Traditionally and increasingly, Non-Governmental Organisations have a significant role to play in the community education process.

Chapter 4 looks at the role of NGOs in general and then focuses on examples of community-based environmental education in Sri Lanka and in the United Kingdom.

Chapter 4

The Role of Non-Governmental Organisations and Community-Based Environmental Initiatives in Sri Lanka and the United Kingdom

4.1 The role of Non Governmental Organisations (NGOs) in promoting community-based environmental education

As globalisation and international trade impact upon societies, non-governmental organisations have become increasingly influential in world affairs. They are consulted by governments as well as international organisations such as the United Nations which have created associative status for them. There are now tens of thousands of NGOs in the world, operating in most countries. These organisations are not directly affiliated with any national government but often have a significant impact on the social, economic and political activity of the country or region involved.

4.1.1 Definition

The World Bank defines NGOs as 'private organisations that pursue activities to relieve suffering, promote the interests of the poor, protect the environment, provide basic social services, or undertake community development'. In wider usage, the term NGO can be applied to any non-profit organisation which is independent from government. NGOs are typically value-based organisations which depend, in whole or in part, on charitable donations and voluntary service. Although the NGO sector has become

increasingly professionalised over the last two decades, principles of altruism and voluntarism remain key defining characteristics.

4.1.2 Operational NGOs

The World Bank classifies operational NGOs into three main groups:

- Community-based organisations - which serve a specific population in a narrow geographic area
- National organisations - which operate in individual developing countries and
- International organisations - which are typically headquartered in developed countries and carry out operations in more than one developing country.

Community-based NGOs are more likely to be the recipients of project goods and services. In projects which promote participatory development, grassroots organisations play the key function of providing an institutional framework for beneficiary participation. Community-based NGOs might, for example be consulted during design to ensure that project goals reflect beneficiary interests; undertake the implementation of community-level project components; or receive funds to design and implement sub-projects. Many national and international NGOs work in partnership with community-based organisations either channelling development resources to them or providing them with services or technical assistance. (World Bank Website, 2001 <http://wbln0018.worldbank.org/essd/essd.nsf/NGOs/home>)

4.1.3 The importance of NGO involvement for environmental education

As discussed in chapter 2, it is an undeniable fact that human beings are having a significant negative impact on the natural environment. As the global population continues to rise, humans place more and more pressure on a finite number of resources. Human environmental impacts can largely be attributed to consumption patterns. As

previously mentioned the best way to promote awareness of environmental issues and promote environmentally responsible behaviours is through increased access to environmental education. NGOs have emerged as major partners in development and conservation activities, performing a multitude of roles including environmental education and awareness-raising among the public. NGOs have helped design and implement environmental policies, programmes and action plans, and set out specifications for environmental Impact Assessments. They also play crucial advocacy roles through their environmental campaigns (Barret, 2005).

NGOs and 'major groups' have a critical part to play in Agenda 21 activities by contributing ideas and spreading knowledge and encouraging involvement. Widespread NGO participation prior to and during the Rio Conference of 1992 (see chapter 2) greatly helped disseminate knowledge of Agenda 21. Agenda 21 activities have led many organisations to broaden their involvement and develop linkages among the environment, development and social justice. The most active bodies have included adult education associations; environmentalist, development co-operation and solidarity organisations; church organisations and at both national and regional levels-associations of local authorities. The major groups identified by Agenda 21 as being critical in its implementation include indigenous people, women, youth, workers, farmers, local governments, the scientific community, business and industry, and NGOs (Role of NGOs and other 'major groups', <http://gdrc.org/uem/la21/ngos.html>).

Non-governmental organisations make a substantial contribution towards implementing preventive environmental policy. By communicating about topical issues, NGOs in many cases help to raise public awareness of specific problems. Through their daily work, their campaigns and local initiatives, NGOs often reach target groups that may not be reached by institutions of formal education. NGOs enjoy a high degree of

credibility and trust among the people of many countries. (Global environmental outlook, 2000 <http://www.grida.no/geo2000/english/0164.htm>).

An analysis of things that NGOs do best suggests that they have been particularly successful in agenda setting. Their primary role is always to catalyse recognition of key problems. Global recognition of many of the major environmental problems of recent years is the result of NGOs putting them on the political agenda, NGOs have a key role in the process of encouraging government authorities to play the role they must play. Another important role is the groundwork which they are able to do more effectively than governments. NGOs are also good at networking among themselves, circulating information and promoting the concept of sustainability. This is a function that should be improved. The engagement of vast numbers of individuals, information dissemination, awareness rising, mobilising the public, occupying political space to catalyse fundamental change, linking multiple actors to highlight unsustainable behaviour and practices are all fundamental roles for NGOs that they are able to perform well.

(The Role and Contributions of Major Stakeholder Groups in the Implementation of Sustainable Development, NGO network <http://www.gdrc.org/ngo/rioplusfive.html>).

Because the nature and quality of individual NGOs varies greatly, it is extremely difficult to make generalisations about the sector as a whole. Despite this diversity it is possible to identify some specific strength generally associated with the NGO sector. These include strong grassroots links, field-based development expertise, the ability to innovate and adapt participatory methodologies and tools, long-term commitment and emphasis on sustainability and cost-effectiveness. The most commonly identified weaknesses of the sector include limited financial and management expertise, limited institutional capacity, low levels of self-sustainability, isolation/lack of inter-

organisational communication and/or coordination, small scale interventions and lack of understanding of the broader social or economic context (Shreve, 2007).

A large number of environmental NGOs exist in Sri Lanka, the UK and around the globe. Later in this chapter we turn to a focus on Sri Lanka and the UK given that these communities are the focus of the research of this thesis. Many of these groups try to garner support for their causes by educating the public about environmental issues in order to promote awareness and concern. Although there have already been benefits seen from these kinds of education campaigns, there are still many obstacles to be overcome including funding shortages and continued public support. Though not all of the issues they support may involve extensive education campaigns, the goal is to expose people to different environmental issues of concern with the hope that exposure will lead to interest and result in personal actions.

At this stage, some examples will be provided of some community-based environmental education programmes in Sri Lanka and the United Kingdom as these are the areas focused on in the thesis. Various examples are given for each country, including the work of some of the substantial NGOs in each.

4.2 Community-based environmental education in Sri Lanka

In Sri Lanka, as in many other developing countries, there is an urgent need for more intensive, yet environmentally appropriate utilisation of the natural resources. Land and water in particular should be used for profitable and sustainable agricultural and related industrial production. Sri Lanka has realised the greatly important need for the involvement of communities in environmental protection and management. Education and the raising of public awareness in environmental education and management are carried out by state, private and public sector agencies. All environmental NGOs are involved in education and public awareness programmes. Many of their activities are

community-based. Let us now examine some particular initiatives and the contribution of leading NGOs.

The Sri Lanka Poverty Reduction Strategy Paper (PRSP) (Regaining Sri Lanka, 2002, <http://www.imf.org/External/NP/prsp/2002/lka/01/120502.pdf>) highlights plans to involve poor communities in decision-making for protected forests, providing funding to communities to replant degraded forest areas, manage buffer zones, and develop timber farms using conservation-oriented cultivation practices, with a goal of halving the rate of deforestation due to encroachment and illegal forest use (Regaining Sri Lanka, 2002:90–91). The poor will be encouraged to participate in the development of Sri Lanka's ecotourism industry by forming community-based organisations in the buffer zones adjacent to national parks and wildlife sanctuaries, which will receive a share of ecotourism earnings and training to assist in wildlife conservation activities. The strategy paper details several initiatives for community-driven development through sustainable management of natural resources (Regaining Sri Lanka 2002: 64, 89-90). Between 1993 and 2000 the government of Sri Lanka implemented the participatory forestry project, with the intent of reducing deforestation and improving household livelihoods by promoting co-management and agro-forestry. The project targeted all state owned degraded forestlands except in the North and Eastern Provinces. The project's main objectives were to facilitate reforestation, by issuing lease agreements to farmers and by adopting a participatory approach to forest management (Kallesoe and Alvis, 2004).

One of the major problems in Sri Lanka is inefficiency in the collection and disposal of waste in urban areas. A case study of good practice in this aspect is Dehiwala Mount Lavinia Municipal Council (DMMC) which has implemented the community-based solid waste management programme as a solution for the problem. Formulation of a sustainable waste management system has become a priority for local and central

government agencies involved in urban development in Sri Lanka. The area served by the Dehiwala Mount Lavinia Municipal Council (DMMC) generates about 150 metric tons of solid waste per day. The municipal council collects about 75% of the waste. Many under-serviced communities in the municipal area either do not receive waste disposal services or have only limited access to such services. Limited institutional and material resources mainly caused by budgetary problems and the lack of suitable land for waste disposal are some of the major constraints the council faces in the provision of an effective waste disposal service to the community. Community-based waste collection, therefore, is not only important as an attempt at urban governance good practice but also to relieve the burden on the council.

The DMMC composting project is part of the 'Sustainable Colombo Core Area Project' funded by the United Nations Development Programme (UNDP) and implemented by the UN Human Settlements Programme. The municipal administration started its first community-based waste management project in 1999. The objective was to get the community to carry out compost production from domestic garbage. The project was a three-way partnership that brought together the community, the municipal council, and an NGO called Sevanatha. Project design was participatory and facilitation and implementation was by the NGO.

During the implementation stage, Sevanatha carried out a needs assessment and an assessment of aspirations through informal meetings, discussions, and interviews of members of the households. Also, formal meetings with the officials of community-based organisations were held to explain the need for waste separation and the associated benefits. Women were given training on how to segregate waste at source and compost the organic waste in barrels. In addition, neighbourhood cleaning

programmes, art and photograph exhibitions for young people, and health programmes were introduced to encourage the families to take part.

The compost was intended for use by community members in their home gardens. To deal with non-biodegradable waste, the project adopted a commercial approach. A recycling centre to buy non-biodegradable waste from households was established with funding support from Japan International Cooperation Agency and assistance from the Municipal Council. The community now successfully operates it (Horen, 2004).

The Green Movement of Sri Lanka (GMSL) is an organisation concerned with environmental conservation and awareness creation. It is a consortium consisting of 147 NGOs, community-based organisations and other groups spread around the island and which are involved in natural resource management. The GMSL envisions the achievement of natural resource-based sustainable development through the empowerment of the poorest sections of the population and conservation of the environment through activities aimed at developing vibrant and sustainable communities throughout the island. The 'Greens' teach students in their schools, farmers in their fields, housewives in their homes or people in nearby schools or temples (Green Movement of Sri Lanka, 2006 <http://www.greensl.net/education.htm>).

Turning to the major international organisation the International Union for the Conservation of Nature and Natural Resources (IUCN), the Education and Knowledge Management Programme of the IUCN Sri Lanka has been designed to specifically address the country's needs in promoting conservation and sustainable use of its rich and varied biodiversity. The IUCN Sri Lanka strategy is to reach out effectively to diverse groups of people and audiences such as school children and teachers (through formal and informal education settings) professionals, state and non-governmental sector officials, law enforcement officers, media personnel, community-based organisations,

rural communities and the corporate sector to bridge the education and communication gaps in the national efforts and mobilise their support to promote conservation and sustainable use of biodiversity. The organisation has developed materials such as posters, brochures and video materials and distributed these to promote awareness of the need to conserve the country's natural heritage. It continuously provides an update on conservation issues and concepts through media briefings and workshops and also undertakes special programmes to train school teachers. These include field training programme on aspects of biodiversity (IUCN, The world conservation union, Sri Lanka country office, 2006 <http://www.iucn.org/places/srilanka/>).

The Sri Lanka Wild Life Conservation Society (SLWLCS) was founded in 1995 to develop a new paradigm for wildlife conservation in Sri Lanka. By approaching environmental conservation through a participatory approach the SLWCS formulates its projects and programmes from the aspects of human needs and aspirations. The SLWCS operates on the philosophy and basic premise that local communities must actively participate as well as benefit from conservation and research efforts to save threatened ecosystems, endangered wildlife and their habitats. In pursuing this objective the society develops its projects and programmes in a 'bottom-to-top' process by assessing the resources, strengths, weakness, threats, and needs of a community and its environment. At the same time the society also approaches conservation in a 'top-to-bottom process' as it realises that it is essential that regional, national and international planners and stakeholders are involved for effective conservation to happen (Sri Lanka Wild Life Conservation Society, 2007 <http://slwcs.org/>).

Finally the large and complex NGO Sarvodaya Shramadana Movement in Sri Lanka is significantly involved in community-based environmental education programmes. Its

endeavours will be addressed in Chapter 7 as it is the organisation responsible for one of the case studies researched for this thesis.

4.3 Community-based environmental education in the United Kingdom

Community-based environmental education is nowhere near as well developed or embedded within UK society as it is in many regions of Sri Lanka. Traditionally, education relating to the environment and environmental protection has been engaged in through the formal sector involving schools, colleges and universities. That said, it is possible to identify a number of initiatives and sustainable schemes that focus on environmental improvement with community involvement; also to recognise the endeavours of a number of NGOs who are very actively engaged in community-based programmes of environmental education.

The first example we turn to focus on the theme of waste materials and very major attempts that are being undertaken to address issues of its management at community 'grassroots' level.

The UK currently faces a massive task in attempting to deal with its household waste. It lags far behind such nations as the United States, Canada, and most of the European Union with regard to recycling rates. In 2000 and 2001, the UK produced 28.2 million tons of Municipal Solid Waste (MSW), 25.1 million tons of this from households. This represents 500 kilograms of waste annually from every household. Only 12% of this waste was recycled, with 79% being sent to landfill. (Department of the Environment, Transport and the Regions, 2002, in Barr, 2007). Hence the debate regarding the disposal of municipal solid waste has become sharpened in recent years in the United Kingdom, with growing public unease at the siting of landfill sites and European Union legislation that has imposed strict targets on the reduction of biodegradable waste going

to landfill. (Department of the Environment, Transport and the Regions, 1999, in Barr, 2007).

To tackle these poor waste statistics, the UK Government has published a 'Waste Strategy' to guide waste policy during the next 15 years (Department of the Environment, Transport and the Regions, 2000, in Barr, 2007). The Strategy states that by 2005, 25% of MSW should be recycled, with 40% being recovered (composting and energy from waste). This rises to 33% recycling with 67% recovery by 2015. It also means putting more emphasis on waste prevention and re-use; and it means motivating individuals and businesses to appreciate the environmental and economic benefits from waste reduction and in obtaining value out of what might previously have been seen as useless waste material.

The vision of the waste strategy in the UK is for 'society as a whole to appreciate the importance of responsible waste management'. This vision encompasses notions of sustainable consumption and production, treating waste as a resource and minimising damaging climate change impacts. In order to achieve this vision, people need to reduce the environmental impacts of their waste, both through what they buy and how they deal with waste in their homes. The strategy is supported by environmental groups who champion high environmental standards and best practice in communities. The Government has been encouraging changes in the behaviour of consumers and householders in a number of ways including information and awareness campaigns such as the national 'Recycle Now' campaign. This has helped increase the numbers of those who consider themselves to be committed recyclers from 45% before the campaign to 57% afterwards.

(Waste strategy for England, 2007, in Department for Environment, Food and Rural affairs, <http://www.defra.gov.UK/environment/waste/strategy/strategy07/pdf/waste07-strategy.pdf>).

Turning to case studies of good practice in the field of waste management at community level, the Fairyland Estate project, implemented by the Environment Agency focused on community participation in waste management. The Fairyland housing estate in Neath is located in an area that ranks among the fifth most disadvantaged in Wales, according to the Welsh Index of multiple deprivation. Unemployment is a particular problem. Several years ago the large numbers of people moving out of Fairyland would often leave their rubbish for the next occupier to deal with. As a result, the estate had very serious fly-tipping and arson problems. A survey of Fairyland residents showed they wanted something done about the litter as well as more play areas and activities for young children. In 2002, 'Environment Agency Wales' helped develop a partnership project called 'Pride In Our Communities' (PIOC), which had a zero tolerance attitude to fly-tipping. The Environment Agency was established under the Environment Act 1995 as a non-departmental public body with the vision of building a rich, healthy and diverse environment for present and future generations. This agency believes that involving people in projects to improve their local environment increases trust and connections within communities (Environment agency, <http://publications.environment-agency.gov.UK/pdf/GEHO0605BJDG-e-e.pdf>).

The 'Pride In Our Communities' project enabled 'Keep Wales Tidy' to employ a fly-tipping officer, who organised a week-long set of spring cleans, with skips supplied by the local council. Hence the Environment Agency established a partnership to work alongside communities. These included Neath and Port Talbot Local Authority, the Countryside Council for Wales and Keep Wales Tidy. The environmental charity Groundwork also helped on the site. Six months of intensive clean-ups followed. The

local authority upgraded the estate's lighting and made a children's play area where local people once burned old furniture. Fun days were set up to involve the public in an informal way. Local children helped design a mural for the centre of the estate. An artist interpreted their ideas and put them together in a final design that was approved by residents. When the people of Fairyland began to realise that somebody was taking an interest in them there was a real change in attitude.

Fairyland is now a more attractive place to live with residents staying for longer. This has led to an improved community spirit, with local people taking much greater pride in their local environment. In 2005, the estate won the 'Tidy Wales Community' award. It also won a 'Community Volunteering Services' award, and received a commendation from the fire brigade recognising the significant drop in non-accidental fires. Residents receive more information about how to contact the local authority to have items removed and how to make the best use of local services. Community groups get to speak to housing and police officers at regular meetings. Residents can report things in confidence and fly-tipping is no longer tolerated. Residents now take great pride in their local environment. Three-quarters of residents are happy living on the estate and over 80 per cent think the area has improved thanks to the project. Achievements here have led to similar projects around Wales. This is an extremely good example of positive outcomes of a community-based initiative. The Environment Agency itself has identified a number of social and economic outcomes of environmental projects of the kind such as that carried out in Fairyland. For example;

- The local economic benefits include: increases in local employment and higher visitor spending; inward investment; and increases in local property prices. Education and training is not limited to children, however, and some adult volunteers are being trained in environmental skills and gaining personal development through environmental projects, which can lead to employment.

- Social equity benefits include positive impacts on health, education and leisure opportunities, with environmental projects also contributing to community cohesion and community safety. (Evans and Purdue, 2005).

(Funnell, 2007 <http://publications.environment-agency.gov.UK/pdf/GEHO0207BLZC-e-e.pdf>)

An examination of the role of NGOs and charities in community-based environmental educational work in the UK suggests that five of the most significant ones include; The Wildlife Trust, The Wild Fowl and Wetlands Trust, Ground Work, The Royal Society for the Protection of Birds and the British Trust for Conservation Volunteers. A little will be said about each of these.

The Wildlife Trusts UK (WLT) was established as an NGO in 1912. It developed during a different period from newer environmental groups which may be thought to be better placed to educate people and gain their commitment to conservation (Palmer and Birch, 2003). Nevertheless, this large organisation is engaged in some examples of excellent practice in communities and in a great deal of grassroots educational work. The vision of the Wildlife Trusts is to create an environment that is rich in wildlife for everyone to appreciate and enjoy. In order to achieve this vision, the Wildlife Trusts are working hard to raise awareness of global environmental challenges, to encourage people to change the way they live and to press for greener policies. There are 47 local Wildlife Trusts across the whole of the UK and their main objectives are to stand up for wildlife and the environment, to create and enhance wildlife havens, to inspire people about the natural world, and to foster sustainable living. Local Trusts are working with local communities to achieve a shared vision and sense of purpose. In more than four decades of partnership since the 1960s, local people have come together through their Wildlife Trusts to save precious places for wildlife. They have been given advice on

land management, taken on nature reserves and influenced planning decisions. Throughout this time Trusts have worked with schools, community groups, statutory agencies, local authorities, landowners and businesses to inspire people about wildlife.

The Wildlife Trusts aim to:

- Provide a range of safe, enjoyable, high-quality learning experiences that promote wildlife conservation and sustainability.
- Use approaches and programmes that have a positive impact on people's wellbeing and quality of life.
- Provide wildlife learning experiences in and outside the classroom.
- Encourage partnerships within communities emphasising sustainability and making links between wildlife and the future of the planet.
- Advance the education of the public and local communities, emphasising the important relationships between sustainable agriculture and wildlife conservation.
- Provide advice, means and support for local people to implement innovative and sustainable projects. (The wildlife Trusts, 2007 <http://www.wildlifetrusts.org/>).

Examples of local initiatives being undertaken by The Wildlife Trusts include those in Preston, Sussex and Lancashire.

In Preston, the local Trust has been working in partnership with Preston City Council to implement a project entitled 'Productive Landscapes in Preston'. This aims to raise awareness of local wildlife issues, protect and enhance the local environment through community involvement, organise activities that involve local people and help them enjoy their local green spaces and develop the skills of local people so they can sustain

their activities in these areas. The scheme designates Local Nature Reserves (LNR's) and encourages local people to use these areas for education and recreation.

The Sussex Wildlife Trust is leading a project to enhance, create and reconnect with natural habitats covering an area of 93 square miles. Local communities and farmers have agreed a shared vision for the project area. The aim is to create a landscape which includes original forest, with glades, pastures and wetlands as well as dense woods. Large, free-roaming animals will graze in core woodland areas and the natural processes of decomposition and regeneration will be encouraged. The Trust is also working with farmers to encourage them to farm more sensitively for wildlife (The wildlife trust, <http://www.wildlifetrusts.org/>).

The Lancashire Wildlife Trust has a 20-strong community team that works to help people recognise the importance of their environment. This team works with community groups and individuals to improve local nature reserves, school grounds, allotments, parks and open spaces. The project involves people of all ages and a variety of cultures, and encourages them to garden for wildlife as well as for growing good food. The aim of the project is to raise awareness and promote the use of locally important wildlife sites through community involvement. (The Wildlife Trust for Lancashire, Manchester and North Merseyside, 2006, <http://www.lancswt.org.UK/>)

The Wildfowl and Wetlands Trust organisation (WWT) is one of largest international wetland conservation charities and is based in the UK. WWT believes that wetlands are vitally important for the maintenance and quality of life. The continued loss and degradation of wetlands threaten the survival of people and wildlife and, in order to conserve wetlands, the consent and involvement of people is imperative. Education has always been central to WWT philosophy and practice and the vision of the organisation is to 'bring people and wildlife together for the benefit of both'. WWT launched its

‘Wetland Challenge programme’ in early 2004. This programme aims to connect children and adults throughout the UK with local wetlands, engage them in active learning and discovery programmes, and promote positive feelings and personal conservation action on behalf of UK wetlands. WWT operates a wide variety of education, awareness, training, advice/consultancy and communications programmes for all audiences from grassroots communities to government agencies, officials and politicians (WWT, Saving wetlands for wildlife and people, <http://www.wwt.org.UK/>).

Groundwork is a leading environmental regeneration charity in the UK which works with governments, local authorities, the private sector and local communities to improve the quality of the local environment, the lives of local people and the success of local businesses in areas in need of investment and support. The organisation was established in 1981 and operates through a federation of local Groundwork Trusts in England, Wales and Northern Ireland with growing European partnerships and international links. It recognises that building successful, mixed communities means planning from the ground up, involving communities in decision-making and ensuring that new developments are integrated with the natural environment and promote sustainable living. Groundwork’s projects and activities are designed to meet the specific needs of local communities but, wherever possible, they are integrated into wider strategic plans and initiatives. In the south and east regions, Groundwork is helping build the right social and environmental infrastructure to help communities cope with growth. The organisation aims to create and manage community facilities and open spaces, deliver training schemes that meet specific skill shortages and help people move back into work while improving homes and the local environment. It also aims to train organisations in reducing their environmental impact, educate children and adults about healthy living and sustainable development, engage tenants and residents in decision-making about services and reduce anti-social behaviour by providing positive activities for young

people (Ground work, <http://www.groundwork.org.UK/publications-and-resources>, 2007).

The Royal Society for the Protection of Birds (RSPB) is a British charitable organisation which works to promote conservation and protection of birds and the wider environment through public awareness campaigns and through the operation of nature reserves throughout the United Kingdom. It is one of the largest wildlife conservation organisation in Europe with over one million members. Work is mainly focused on the species and habitats that are in the greatest danger. RSPB belief that: 'birds and wildlife enrich people's lives, the health of bird populations is indicative of the health of the planet and all the people have a responsibility to protect wildlife'. The RSPB works to protect, restore and manage habitats for birds and other wildlife. It conducts research on problems facing birds and the environment, looks for practical solutions that can be implemented on the ground, carries out 'hands-on' recovery projects for most threatened species, shares knowledge and enthusiasm to help young and old enjoy the natural world and works with landowners and farmers to help preserve countryside birds (RSPB home page <http://www.rspb.org.UK/>).

The British Trust for Conservation Volunteers (BTCV) charity was set up in 1959, and has a successful history of environmental conservation volunteering throughout the UK and around the world. Its vision is 'a better environment where people are valued, included and involved'. The BTCV organisation believes that there is a direct link between healthy environments and healthy communities. Active citizens who are able to enjoy access to local green space are also more likely to enjoy good physical and mental health. The organisation aims to work supportively and inclusively with community groups, and the process includes nurturing of leadership skills within the community for its long term benefit (BTCV home page, http://www2.btcv.org.UK/display/btcv_home).

Independently and collectively the work of such NGOs and other initiatives deriving from governments and charities make significant educational impact upon individuals and local communities. As has been demonstrated, communities in both Sri Lanka and the UK are greatly benefiting from interventions and projects which have genuine community involvement and which have aims firmly grounded in localities and their local needs. In each of the examples of NGOs and particular schemes which have been included in this chapter, it is possible to identify active engagement by local people, and community-agreed aims and objectives which have to do with improving both environmental quality and the quality of life for those living in the community in question.

Inevitably however, such initiatives and projects often have limitations. One limitation lies in the fact that various projects focus on a single aspect of the environment-for example waste management in Fairyland Estate and the Dehiwala Mount Lavinia municipal programme, poverty reduction in the case of the Sri Lanka Poverty Reduction Strategy, wildlife in the case of Wildlife Trusts UK and birds in the case of the UK's Royal Society for the Protection of Birds. They do not embrace the totality of the environment of the communities involved.

A second limitation lies with the fact that community-based educational projects such as those which are described within this chapter do not necessarily engage the whole community within which they are situated. Some, such as the Fairyland Estate appear to have major impact upon the lives of the vast majority of community members, whilst others, including Wildlife Trusts, BTCV and RSPB projects are entirely dependent upon well motivated volunteers. Such volunteers may be small in number compared to the population of the communities which they are representing.

Hence attention now turns to whole communities that are internationally planned and developed to promote environmental understanding and sustainability. By definition, such whole communities or 'eco-villages' overcome both of the limitations outlined above. They focus on the whole environment of the community rather than on selected aspects of it, and they function as a result of whole community participation.

Chapter 5 provides an overview of the concept of an eco-village before Chapter 6 outlines the methodology for the empirical research and Chapters 7 and 8 present the case studies of eco-villages in Sri Lanka and the UK.

Chapter 5

The Concept of an Eco-village

Eco villages are intentional communities. In other words they are planned residential communities designed to promote a much higher degree of social interaction than other communities. The members of such an intentional community typically hold a common social, political or spiritual vision and are striving to create cooperative lifestyles in harmony with their local environments. There are thousands of eco-villages all over the world that are developing and refining social and ecological tools such as consensus decision-making, inter-generational care, alternative economic models, whole systems design, permaculture practices, renewable energy systems, and alternative modes of education that offer positive visions and real-life solutions for humanity and the planet. These communities are part of an emerging, truly sustainable culture, and have the following characteristics:

- They are on a human-scale
- They are 'full-featured' settlement
- They are places in which human activities are harmlessly integrated into the natural world
- They function in a way that is supportive of healthy human development and can be successfully continued into the indefinite future (Gilman, 1991, in Irrgang, 2005).

Let us explore these characteristics in greater detail:

Human-scale refers to a size in which people are able to know and be known by the others in the community, and where each member of the community feels that he or she is able to influence the community's direction. In modern industrial societies and in

other cultures, the upper limit for such a group is roughly 500 people. In very stable and isolated situations it can be higher, perhaps as high as 1,000.

A 'full-featured settlement' is one in which all the major functions of normal living - residence, food provision, manufacture, leisure, social life, and commerce - are plainly present and in balanced proportions. This does not mean that eco-villages have to be fully self-sufficient or isolated from the surrounding community. As an ideal, an eco-village will have as many jobs within it as there are employed people who live in the eco-village; but some of the villagers will go outside the village to work, and some of the jobs in the village will be held by people who reside outside the village.

This idea of 'in which human activities are harmlessly integrated in to natural world' brings the 'eco' into the eco-village. One of the most important aspects of this principle is the ideal of equality between humans and other forms of life, so that humans do not attempt to dominate over nature but rather find their place within it. Another important principle is the cyclic use of material resources, rather than the linear approach (dig it up, use it once, throw it away forever) that has characterised industrial society. This leads eco-villages to the use of renewable energy sources (eg. solar, wind) rather than fossil fuels; to the composting of organic wastes which are then returned to the land rather than sending these to a landfill, incinerator, or sewage treatment plant; to the recycling of as much of the waste stream as possible; and to the avoidance of toxic and harmful substances.

To ensure the harmless integration of eco-village activities in to the natural world, eco-villages should

- Preserve natural habitats on the village land.
- Produce food, wood and other bio-resources on site.

- Process the organic waste produced on the site.
- Recycle all solid waste from the village.
- Avoid adverse environmental impact off site from the use and disposal of any products.
- Built with ecological friendly materials.
- Use renewable energy sources.
- Have minimal need for vehicle transport.
- Be built in ways that have a minimal impact on the land and the local ecology.

To 'support healthy human development' eco-villages should balance public and private life; encourage community interaction and support diverse activities. They should encourage a balanced and integrated development of all aspects of human life-physical, emotional, mental, and spiritual. This healthy development needs to be expressed not just in the lives of individuals, but in the life of the community as a whole.

'Successfully continued in to the indefinite future', indicates the relevance of accepted sustainability thinking to eco-villages; that the sustainability principle requires a commitment towards fairness and non-exploitation. This translates into respect for other parts of the world, human and non-human and future life. A decreased dependence on capital imported from outside the eco-village and greater self-sufficiency in terms of food production is one way in which eco-villages can fulfill the criteria (Irrange, 2005).

In other words the deep motivation for eco-villages or intentional communities is the need to reverse the gradual disintegration of supportive social-cultural structure and the upsurge of destructive environmental practices on the planet. Underlying the concept of the eco-village is the desire to take responsibility for one's own life; to create a future which, contrary to the depleting energies of the 'mechanical' world dominated by

organisational giants, is regenerative for the individual and for nature, and thereby sustainable into the indefinite future (Jackson and Svensson, 2002).

Eco-villages are described by the Global Eco-village Movement (2005) as urban or rural communities of people who strive to integrate a supportive social environment with a low impact way of life. To achieve this they integrate various aspects of ecological design, permaculture, ecological building, green production, alternative energy and community building practices (Irrgang, 2005).

Jackson and Svensson (2002) defined eco-villages as communities of people who strive to lead a sustainable life style in harmony with each other, other living beings and the earth. Their purpose is to combine a supportive social-cultural environment with a low impact lifestyle.

The sustainability principle brings with it a profound commitment to fairness and non-exploitation towards other parts of today's world, human and non-human, and toward all future life. Many traditional communities were and are like this, and often those remaining today are struggling for survival. Now eco-villages are being created internationally by a global movement called the Global Eco-village Network, an organisation comprising more than 13,000 eco-settlements on the planet.

The goal of most eco-villages is to be a sustainable habitat providing for most of its needs on site: A sustainable habitat is an ecosystem that produces food and shelter for people and other organisms, without resource depletion and in such a way that no external waste is produced. Thus the habitat can continue into future time without external infusions of resource. Such a sustainable habitat may evolve naturally or be produced under the influence of human life (such as a restored biosphere).

The more general term 'sustainable community' includes eco-villages, but it also includes clusters and networks of eco-villages and non-geographically based communities (such as business) that are nevertheless human scale in their components.

According to Roseland (1998) a sustainable community is a community that uses its resources to meet current needs while ensuring that adequate resources are available for future generations. A sustainable community seeks a better quality of life for all its residents, while maintaining nature's ability to function over time by minimising waste, preventing pollution, promoting efficiency and developing local resources to revitalise the local economy (in Irrgang, 2005).

In his discussion of sustainable community, Klein (2003, in Irrgang, 2005) offers four characteristics of such a community. These are:

- Economic security

A more sustainable community should provide a variety of business opportunities, industries and institutions which are environmentally sound and financially viable. These should provide training, education and other forms of assistance to ensure adjustment to future needs. Jobs are to be available to community members and they should have a voice in decisions which affect them. In a sustainable community residents money remains in the community.

- Ecological integrity

A sustainable community stays in harmony with nature by utilising environmental resources for human needs without undermining their ability to function over time. Such a community also respects natural systems by reducing and converting waste in to non-harmful and beneficial products.

- **Quality of Life**

A sustainable community recognise and supports people's senses of wellbeing. These includes a sense of belonging, a sense of place, a sense of self worth, a sense of safety and a sense of connection with nature. Goods and services are provided which meet people needs, but with the ecological integrity of natural systems in mind.

- **Empowerment and responsibility**

In a sustainable community people are empowered to take responsibility based on a shared vision, equal opportunity, ability to access expertise and knowledge for their own needs and capacity to affect the out come of decisions which affect them.

By way of summary a sustainable community is one that can persist over generations as its physical and social systems of support remain intact (Irrgang, 2005).

5.1 Features of the eco-village

The ecological dimension of eco-villages denotes people's connection to the living earth: the soil, water, wind, plants and animals. It ranges from an expressed intention to save energy and recycle waste to a more all-round commitment to low-impact living, integrating village-based energy system, water treatment plants, earth restoration, permaculture and ecological buildings.

In reality the ecological dimension involves:

- Creating living homes out of natural, locally available materials and using local architectural tradition.
- Using a village-based integrated renewable energy system.
- Using small and slow solutions.
- Applying self-regulation and accepting feedback.
- Preserving clean soil, water and air through proper energy and waste management.

- Protecting and encouraging bio-diversity and safeguarding wilderness areas.
- Integrating rather than segregating.
- Growing organic foods as much as possible within the community bio-region.
- Adopting ecological business principles.
- Assessing the life cycle of products used in the eco-village from social, spiritual and ecological points of view (Jackson and Svensson, 2002).

All of these principles have found a home, to varying degrees, in the global eco-village movement, which has adopted such general principles and adapted them to local contexts and community life.

Let us now look at the characteristics of an eco-village in greater detail:

An eco-village usually relies on permaculture; which may be described as a moral and ethical design system applicable to food production and land use, as well as community design. It seeks the creation of productive and sustainable ways of living by integrating ecology, landscape, organic gardening, architecture, agro-forestry, green or ecological economics, and social systems. The focus is not on these elements themselves, but rather on the relationships created among them by the way they are placed together; the whole becoming greater the sum of its parts. Permaculture is also about careful and contemplative observation of nature and natural systems, and of recognising universal patterns and principles, then learning to apply these 'ecological truisms' to one's own circumstances in all realms of human activity.

Turning to housing, a primary feature of the eco-village project will be the methods applied to the socio-economics of low income housing. Homes will not be ordinary built, or factory-built houses, but will be predominately constructed of indigenous and

renewable construction materials such as earth, tile, stone, and other traditional techniques.

Terms commonly associated with eco-village development and components include ‘co-housing’, ‘autonomous building’ and ‘green building’, about which a little more will now be said. A ‘co-housing’ community is a kind of intentional community composed of private homes with full kitchens, supplemented by extensive common facilities. A co-housing community is planned, owned and managed by the residents-groups of people who want more interaction with their neighbours. Common facilities vary but usually include a large kitchen and dining room where residents can take turns cooking for the community. Other facilities may include a laundry, pool, child care facilities, offices, internet access, game room, TV room, tool room or a gym. Through spatial design and shared social and management activities, co-housing facilitates increased intergenerational interaction among neighbours, for both social and practical benefits. There are also economic and environmental benefits to sharing resources, space and items.

An ‘autonomous building’ is a building designed to be operated independently from infrastructural support services such as the electric power grid, municipal water systems, sewage treatment systems, storm drains, communication services, and in some cases public roads. Advocates of autonomous building describe advantages that include reduced environmental impacts and cost efficiencies.

‘Green building’ is the practice of increasing the efficiency with which buildings and their sites use and harvest energy, water, and materials, and reducing building impacts on human health and the environment. This may be achieved through better siting, design, construction, operation, maintenance, and removal — the complete building life cycle.

Turning to the subject of energy, the key term appropriate for eco-village is 'renewable energy'. This is energy derived from resources that are regenerative or, for all practical purposes cannot be depleted. All energy which the village uses can easily be produced renewably by means of wind and sun power and the use of bio-fuels. For this reason, renewable energy sources are fundamentally different from fossil fuels, and do not produce as many greenhouse gases and other pollutants as fossil fuel combustion. Humankind's traditional uses of wind, water, and solar energy are widespread in developed and developing countries; but the mass production of electricity using renewable energy sources has become more commonplace recently, reflecting the major threats of climate change due to pollution, exhaustion of fossil fuels, and the environmental, social and political risks of fossil fuels and nuclear power.

Wind power is the fastest growing of the renewable energy technologies. Over the past decade, it has been shown that airflows can be used to run wind turbines and some are capable of producing 5 megawatts of power. Areas where winds are stronger and more constant, such as offshore and high altitude sites are preferred locations for wind farms. 'Solar energy' refers to energy that is collected from sunlight. Solar energy can be applied in many ways, including energy in water (in the form of motive energy or temperature differences) which can be harnessed and used. Since water is about a thousand times denser than air, even a slow flowing stream of water, or moderate sea swell, can yield considerable amounts of energy. Bio-fuels are also significant in eco-villages as an energy source. Plants use photosynthesis to grow and produce biomass. Also known as bio-matter, biomass can be used directly as fuel or to produce liquid bio-fuel. Agriculturally produced biomass fuels, such as bio-diesel, ethanol and bagasse (often a by-product of sugar cane cultivation) can be burned in internal combustion engines or boilers. Typically bio-fuel is burned to release its stored chemical energy.

Research into more efficient methods of converting bio-fuels and other fuels into electricity utilising fuel cells is an area of very active work.

The use of water is of fundamental importance in an eco-village. Water is a most important utility, and is fast becoming a scarce resource. There are many methods of collecting and conserving water, and use reduction is usually quite cost-effective. Water abundance will be assured by completing the hydrological cycle by harvesting rain, and also by extracting water from bio-remediation sewage treatment. The basis of bio-remediation is that all organisms remove substances from the environment to carry out growth and metabolism. Grey water systems reuse wash water to flush toilets, and water lawns and gardens. Grey water is non-industrial wastewater generated from domestic processes such as washing dishes, laundry and bathing. Grey water systems can halve the water use of most residential buildings; however, they require the purchase of a sump, grey water pressurisation pump and secondary plumbing. Some builders are installing waterless urinals and even composting toilets that completely eliminate water usage in sewage disposal. It is often more economical to design a building to use rain, with supplementary water deliveries in a drought.

Water-saving technologies for the home include low-flow shower heads (sometimes called energy-efficient shower heads as they also use less energy, due to less water being heated), low-flush toilets, composting toilets and waterless urinals, which can have a dramatic impact in the developed world, as conventional Western toilets use large volumes of water. Faucet aerators, which break water flow into fine droplets to maintain 'wetting effectiveness' while using less water are also important, as is the recycling of waste water through purification at a water treatment plant.

The consideration of sewage is significant. The intention here is to complete the nutrient cycle through the purification of sewage by biological treatment. (bio-remediation) The sterilised effluent will then be used for agriculture.

As far as the all important topic of food is concerned, urban agriculture, combined with more remote farming sites, will produce the calorie and vitamin equivalent of a balanced, nutritious diet for all eco-village inhabitants. The inhabitants of a true eco-village need to own their means of production as much as possible. This helps ensure a healthy home-grown business climate where the management recognises its responsibility to its neighbours, and profits tend to remain in the community. Local purchasing is undertaken so as to support the local economy. This requires a preference to buy locally produced goods and services. It is very often abbreviated as a positive goal 'buy local' to parallel the phrase 'think globally, act locally', which is common in green politics. Local food or 'food patriotism' is a principle of sustainability which relies on consumption of food products that are locally grown. It is part of the concept of local purchasing; a preference to buy locally produced goods and services.

Alongside the significance of housing, renewable energy, efficient use of water, appropriate fuels and the consumption of local food lies the requisite social dimension of an eco-village. This refers to people's desire to spend more time together, and create a supportive environment where individuals can thrive both as free human beings and as part of a group. Eco-villages are small enough so that everyone feels empowered. People are able to take part in making decisions that affect their own lives and that of the community and this is achieved on a transparent basis. People engage in consensus decision-making, which is a decision-making process that not only seeks the agreement of most participants, but also aims to resolve or mitigate the objections of the minority

to achieve the most agreeable decision. Consensus is usually defined as meaning both general agreement, and the process of getting to such agreement.

Villages approach economics within the village in a 'green manner'. The economy is considered to be a component of, and dependent upon, the natural world within which it resides and of which it is considered a part. It takes the widest possible view of stakeholders of a transaction to include impacts to nature, non-human species, and the planet. The eco-village economic base may be rooted in small scale manufacturing firms. These firms will be engaged in processing the materials, and developing the components necessary to build, and afterwards to sustain, the eco-village.

For children, eco-villages provide a loving environment where they are involved in daily tasks such as gardening and building. This enables them to learn variety of skills through practical experience (Jackson and Svensson, 2002). They may participate in a community education system that is created and directed within the community.

Some eco-villages act as both 'living and learning' centres. They are ecological communities that provide ideal campuses for students to learn about sustainable development. People learn to live in harmony with local environments as they investigate personal and community-based solutions to the 'real' world. Such living and learning centres are powerful catalysts for change. They are places where people can come and learn about sustainable living through practical experiences that can be replicated throughout the world.

Within an eco-village living and learning centre, people are committed to sustainable living and to putting more into the environment than they take out of it. Their infrastructure reflects this.

Such places:

- Create local models of sustainable community development that demonstrate practical solutions for self-sufficiency.
- Provide integral lifestyles and offer hands-on experiential training.
- Show people how to protect and restore nature
- Honour indigenous people and help empower them to maintain their lands and traditional livelihoods.
- Strengthen sustainable rural life and create viable new urban models.
- Show how renewable energy and ecologically-effective waste systems work.
- Focus on food security and meaningful livelihood for all.
- Reflect the world's great cultural, spiritual, and artistic diversity.
- Encourage a child-friendly world and a sense of belonging.
- Support local solutions to planetary problems because we live on one Earth.

(GAIA education, <http://www.gaia.org/gaia/education/living/>)

Many individual eco-villages have also developed ongoing collaboration with schools, colleges and universities. They act as a major focus for environmental education, a theme that will be explored in greater depth in the case studies that follow in this thesis.

5.2 Eco-villages around the world

So far the description of eco-villages has drawn attention to the essential characteristics and aims of eco-villages in general terms. Inevitably there are different interpretations of the principles and characteristics in different global locations. At the heart of world eco-village endeavours lies the Global Eco-village Network (GEN) as previously mentioned.

Living and Learning Centres, in the formal sense of the term, are central to GEN's strategy. Community-based demonstration and teaching centres offer people the opportunity to come and learn about sustainable living through practical experiences

that can be replicated throughout the world. They are local planetary models that can be powerful catalysts for change.

GEN Living and Learning Centres constitute just one of many models in the field of education for sustainability today. What is distinctive about them is their power as community-based demonstration and teaching centres to provide working models for harmonious and sustainable living. These models can be replicated because they are easily adaptable to different cultural and social contexts. The core vision is to train trainers in outreach programmes based on global planetary awareness and to provide meaningful livelihoods at home. Living and Learning Centres work in close co-operation with like-minded people to build communities. They foster a strong commitment to restoring the Earth, ensuring young people a viable future, and creating a new planetary harmony based on greater awareness of how to 'live lightly' on the Earth.

Examples of such educationally focused eco-villages in different global locations are as follows.

Sri Lanka

Sarvodaya in Sri Lanka is a network of more than 12,000 self-sustaining villages that focuses on participatory community development with no poverty and no affluence, agriculture, micro-banking, livelihood training, cross cultural-meditation, and pre-school development. The Tanamalwila Living and Learning Centre located near two national parks in the Southeast of Sri Lanka, focuses on permaculture, species diversity, human rights and peace initiatives. It offers regular courses to community-linked people in Southeast Asia.

'Sarvodaya Damniyamgama' eco-village is located in Kalutara district about five kilometres from the sea on a piece of land granted by the government. Placed on a gentle five-acre slope bordering rice fields, the main feature of the village is fifty-five eco-friendly houses, a multi-purpose community centre, ample water resources, renewable energy sources, permaculture practices, a comprehensive road network, and extensive green areas. This village is the subject of the Sri Lanka-based case study that is documented in detail in Chapter 7.

The United Kingdom

Findhorn eco-village in Scotland, in the United Kingdom offers holistic education programmes. These include an annual eco-village training programme, permaculture workshops, courses in personal development, spirituality, arts and crafts. Findhorn is part of a large organic community-supported agricultural scheme, and has its own currency and bank, uses renewable energy systems (solar, wind and biomass), recycles waste, including sewage treated in a reed-bed living machine system. It has many community-based enterprises and is creating a village of eco-sensitive houses. Findhorn is home to an award-winning re-forestation project, Trees for Life. This eco-village is the subject of the second case study of this thesis, documented in detail in Chapter 8.

Australia

Crystal Waters eco-village in Australia offers courses in permaculture design, environmental restoration and community work. It is in a United Nations Habitat Award-winning eco-village which features housing in rammed earth, pole structures, mud brick, domes, and straw bale. Demonstration sites exist for water harvesting, waste water use, rainwater collection, swales, dams, artificial wetlands, biolytic treatment, compost toilets, stand-alone and grid-connected solar power systems, heat pumps, cell grazing, land restoration, reforestation, orchard culture, wildlife corridor and rainforest

applications. Crystal Water has an excellent range of eco-systems, and abundant and diverse wildlife, which lives in harmony and close proximity with humans. This eco-centre is an ideal place for a people to have experience of living in such ways and is linked to credit-earning university programmes.

South India

Auroville eco-village in South India is a multicultural eco-city that has been endorsed by UNESCO as a universal city of the future. It has a wide variety of programmes and receives visiting researchers, university students, and international volunteers. Programmes exist in low cost building technology and sustainable living; food security and organic farming; training in architectural applications and town planning. There is also emphasis on environmental education, creating seed banks and medicinal plant gardens, and doing research on traditional botanical knowledge.

Germany

ZEGG (Centre for Experimental Society Design) in Germany actively promotes an ethic of peace and sustainable living. ZEGG offers courses in ecological building and renovation, mud-construction, organic gardening, permaculture design, spiritual ecology, the arts, social communication, conflict resolution, social networking, strategies for peace, and environmentally sustainable enterprises. The ZEGG annual summer camps offer courses on everything from child rearing to countering global consumerism and resolving planetary crises.

Tennessee, The United States of America

In America, The Farm in Tennessee Village is oriented towards low-cost, high satisfaction community living and self-reliance. It offers examples of solar building design, micro-enterprise development, large scale composting, food production, and

regenerative hardwood forest management. The eco-village training centre at The Farm offers total immersion courses ranging from basic and advanced permaculture and village design to solar electricity, water treatment, and natural building techniques. It provides opportunities to experience a straw bale dwelling, organic gardens, rain water harvesting facilities, greenhouses, root cellars, a wetlands filtration system, and a solar car prototype. The Farm manages 400 acres of designated wilderness preserve. It has a nursery for indigenous tree species, a forest mushroom laying yard, and many species of temperate bamboo. The community has outreach programmes in Central and South America.

Brazil

The Institute for Permaculture and Eco-villages in the Cerrado (IPEC) in Brazil, develops sustainable systems that represent viable solutions to the social and ecological problems of Brazil. It collaborates closely with its partner Permaculture Latin America. IPEC is the central hub for the rapidly developing national permaculture network. Areas of interest include viable appropriate technology, community models in applied permaculture and village development, food production, natural architecture, nature conservation, reforestation and urban kitchen gardens. Courses provide organic produce certification and permaculture design certificates. Village women's co-operatives, eco-tourism, aqua-culture, organic agriculture, and appropriate housing design are also encouraged. The IPEC provides environmental education textbooks for schools, and text on appropriate village building technologies. The network has strong links to indigenous communities.

The United states of America- New York

The eco-village at Ithaca located in the Finger Lakes region of upstate New York, is part of a growing global movement for a more sustainable human culture. This village was

started as an educational project in 1991. It was meant to be a living example of a more sustainable way of life that would demonstrate both social and ecological alternatives to the status quo. The village currently includes two 30-home co-housing neighbourhoods, an organic vegetable farm, an organic berry farm, office spaces for cottage industry, an education office, a warm-season grasses ecosystem restoration project, a sheep pasture, and varied natural areas. Over the past twelve years Ithaca eco-village has developed a wide array of educational opportunities. With the assistance of grants from the National Science Foundation, it has provided courses on the 'science of the sustainability', 'energy efficiency and sustainable energy'. A unique collaboration between a college and an eco-village has allowed the students from Cornell, Ithaca College, and Wells to find real-life ways to address issues of environmental and social sustainability. Most of the teaching in the village takes place with college students, but it also hosts visitors of all ages and backgrounds.

Having explored the concept of the eco-village and eco-communities in general, and highlighted some examples of successful communities around the world which have been developed on the basis of eco-village principles, this thesis now presents two detailed case studies which have been researched. After an outline of methodology used, Chapter 7 takes us to Sarvodaya's Damniyamgama in Sri Lanka and Chapter 8 takes us to Findhorn eco-village in Scotland.

Chapter 6

Methodology for Case Study Research

6.1 Context

As explained in Chapter 1, two eco-villages were chosen as case studies for this thesis, because of their unique community-based environmental education programmes and the incorporation of sustainable lifestyles within the community setting. Both eco-villages are members of the Association of Global Eco-village Network. The author of this thesis acted as project manager at the Damniyamgama eco-village in Sri Lanka. Research was planned to examine the role of the two eco-villages in community-based environmental education and sustainable living, and to compare the functions and effectiveness of the two villages. It was hoped that transferable outcomes would be identified which the author could then implement in Sri Lanka after concluding this research.

The aims of the work, as set out in Chapter 1, are:

- To examine how successfully concepts of sustainable development are incorporated within both the named eco-villages.
- To review aspects of the current educational activities in both eco-villages; to identify what roles eco-villages play in the transfer of environmental knowledge, information and ideas to the community, and beyond it.
- To make comparisons between the eco-villages and to identify transferable outcomes that could be implemented elsewhere.
- To identify areas that would benefit from further development in both of the eco-villages studied.

6.2 Choosing research sites

This study was designed to use two case study locations, one in Sri Lanka, and the other in UK. Sri Lanka was selected because the author has prior experience with that eco-village. A well-established eco-village in Scotland was selected because it is the most well-developed and comprehensive eco-village in the UK. A deliberate decision was made to include one 'new' village and one longer established one as both have a good deal to impart about development and achievements which could be transferable.

6.2.1 Sri Lanka case study eco-village

The Damniyangama eco-village is located in the Kalutara district south of Colombo. The village was built as a resettlement scheme for tsunami affected families. In-depth information about the village will be presented in Chapter 7.

6.2.2. Case study eco-village in United Kingdom

Findhorn eco-village is based at the Park, in Moray, Scotland. The community began in a caravan park, and is known internationally for its experiment with new models of holistic and sustainable living. The case study of Findhorn eco-village will be presented in Chapter 8.

6.3 Selection of research focus and interview samples

6.3.1 Case study

The author of this thesis chose a case study design because it involves detailed, in-depth data collection involving multiple sources of information. This study seeks to provide insight into the process of conducting community-based environmental education and its achievements. In order to do so, the study utilises its qualitative case study approach to examine the method of delivery of community-based environmental education in the eco-village setting. The two case studies are described and analysed in order to

understand the sustainable community setting, the role of community education, the factors that facilitate or hinder the process, and the benefits of conducting community-based environmental education.

The reasons for choosing the case study design for the research rather than any other design requires further explanation.

Robson (2002) explains that case study means examining the situation of an individual, group, organisation, or whatever it is that the study aims to investigate. He further developed a definition for the case study as; ‘a well established research strategy where the focus is on a case (which is interpreted very widely to include the study of an individual person, a group, a setting, an organisation, etc.) in its own right, and taking its context into account’. Typically, this involves multiple methods of data collection. It can include quantitative data, though qualitative data are almost invariably collected (Robson, 2002: 178). A similar explanation is given by Merriam (1998, in Tinkler, 2004) that; case studies can be particularly useful for studying a process, program or individual in an in-depth, holistic way that allows for deep understanding. Furthermore Merriam points out that a case study design is employed to gain an in-depth understanding of the situation and meaning for those involved. The interest is in process rather than outcomes, in context rather than a specific variable, in discovery rather than confirmation. At the centre of this particular study is that of the discovery of the role of eco-villages in community-based environmental education by comparing communities in Sri Lanka and the UK.

In further defence of the use of a case study approach, fundamental research questions about the eco-village include why and how eco-villages were initiated, why eco-villages are defined as sustainable communities and what they offer in the delivery of education. Yin (1996, in Birch, 2003: 109) explains how case studies are useful for going beyond

basic descriptions and explanations that may be provided by a survey or any other means. Quantitative methods of research, such as the survey, focus on the questions of who, what, where, how much, and how many, and archival analysis, which often situates the participant in some form of historical context. Yin suggests that a case study approach on the other hand is able to address the 'how' and 'why' questions in sufficient depth. Similarly, case studies are the preferred method when the researcher has little control over the events, and when there is a contemporary focus within a real life context. The author believes that it is necessary to investigate 'hows' and 'whys' to present the reader with in-depth description. In this way, the study of the eco-villages fits within a real life context and may incorporate situations and events, over which the researcher can have little or no control.

Robson (2002: 181) identifies a categorisation of case studies as follows:

- Individual case study: this is a detailed account about one person. Although, these tend to focus on antecedents, contextual factors, perceptions and attitudes preceding a known outcome (ex: drug use, immigrant status), they can be used to explore a wide range of possible causes, determinants, factors, processes, experiences, etc., contributing to the outcome.
- Set of individual case studies: as above, but the focus for study is on a small number of individuals with some features in common.
- Community study: this is the study of one or more local communities. It describes and analyses the pattern of, and relations between, the main aspects of community life (Politics, work, leisure, family life, etc). Although commonly descriptive, it may allow for the exploration of specific issues, or be used in theory testing.

- Social group study: these cover studies of both small direct contact groups (for example: families) and larger, more diffuse ones (for example: occupational groups). They describe and analyse relationships and other activities.
- Studies of organisations and institutions: included amongst these are studies of firms, work places, schools, trade unions, etc. They allow for exploration of many possible 'best practices,' management and organisational issues and cultures, process of change and adaptation, etc.
- Multiple case studies: in many studies, it is appropriate to study more than a single case. Yin (1994) makes the useful analogy that carrying out multiple case studies is more like doing multiple experiments. Yin (2003) points out that multiple cases may be chosen to try to replicate insights that you find within individuals cases, or to represent contrasting situations. Regardless of whether the purpose is replication, or contrast, multiple case studies are 'considered more compelling, and the overall study is therefore regarded as more robust'.

This research clearly falls within the category of community study, whilst also embracing some elements of multiple study. The research is focused on two eco-village communities and analyses village settings and community life, while giving special consideration to community-based environmental education. The original intention in using multiple case studies was to allow the comparison and identification of transferable outcomes and areas for further development. Although information contributes to the whole study, each case remains a single case. This is certainly the approach of the present research. This research also includes a longitudinal element in one of the case studies. Robson (2002) acknowledges that a longitudinal element means that the researcher is often a participant of an organisation, or member of a community for many months or years. Alternatively, he or she may conduct interviews with individuals over a lengthy period. In the case study of Damniyamgama, the researcher is

an employee of the Sarvodya organisation and she had prior experience with conducting interviews with people who were involved with the eco-village development project. Interviewing was the main method of collecting data from individuals within each village, as discussed in section 6.5 below.

6.3.2 Selection of the sample

Purposive sampling was carried out under non-probability sampling technique for the selection of a sample for interviewing and discussion purposes in both eco-villages. In probability sampling, it is possible to specify the probability that any person (or other unit on which the survey is based) will be included in the sample. Any sampling plan where it is not possible to do so, is called a ‘non-probability sampling’. Purposive sampling is a non-representative subset of some larger population and it relies on the researcher’s judgment as to typicality, or interest (Robson, 2002: 264). Similarly Yin (1994) explains that the selections of participants are made based on their ability to provide relevant data in the area under investigation. Hence, to obtain extensive information from the research sample for the present study, populations were selected including staff members, community members, the owners of the independent businesses, outside resource persons and participants in the educational programmes. Tables 6.1 and 6.2 provide details of the sample of interviews in both of the case study locations.

Table 6.1 Details of sample population in Damniyamgama

Category of the interviewee	Number and roles of the people
Sarvodaya head office staff	3- Directors of the Sarvodaya Shramadana Movement who are responsible for initiation and implementation of the pilot

	<p>project.</p> <p>1- Person who responsible for implantation of projects for livelihood improvement.</p> <p>The author of this thesis was responsible for the organisation and implementation of environmental education programmes and the incorporation of environmental management within the village.</p>
Kalutara Sarvodaya district office staff	<p>District Co-ordinator, who is responsible for field level implementation of the project,</p> <p>3- Field staff, responsible for social mobilisation and field level implementation of different programmes and activities.</p> <p>3- Persons responsible for pre-school programmes, community health programmes, spiritual development programmes.</p> <p>4- Sarvodaya engineers, technical officers</p>
Officers of the village Sarvodaya Shramadana Sangamaya	<p>2- President and the secretary of the village Sarvodaya Shramadana Sangamaya, which is the village level community organisation</p>

	responsible for village management.
Community members	People who have resettled in the village and are the members of village Sarvodya Shramdana Sangamaya.
Outside resource persons	People who came for conducting programmes such as environmental education, waste management, and efficient use of solar panels.
Visitors	Local and international people that are visiting the village to get field level experience about sustainable community living.

Table 6.2 Details of sample population in Findhorn eco-village

Category of the interviewee	Number and roles of the people
Findhorn Foundation staff	<p>Former Chairperson of the Findhorn Foundation. She has been a member of the Foundation from the beginning and has knowledge and experience of the development of the eco-village.</p> <p>1-Manager who initiated the projects titled eco-currency and generation of wind energy.</p>

	<p>2- Managers of the Foundation who are responsible for organising and conducting education programmes.</p> <p>1- Lecturer, as well as being a staff member is also responsible for conducting education for sustainable development courses.</p> <p>2- Staff members, responsible for administration</p>
Visitors	6- Participants on educational and spiritual development programmes.
Volunteers	Doing volunteer work in the community garden and community centre.
Independent business owner	1- Phoenix shop
Staff member of Trees for Life charitable trust	1- Manger
Out side resource person	Delivers the course for spiritual development within the community.
Community members	People who are part of community life.

6.4 The data collection procedure

In order for a comprehensive set of information to be collected for this research, more than one information collection approach was utilised. This followed published advice and combined the strengths of the approaches, and reduced the deficiencies found in any

one approach (Patton, 1987, in Polistina, 2005). The approaches utilised in this research took the form primarily of in-depth face-to-face interviews and informal discussions and were supported through direct observations on site visits, participation in village level activities, taking field notes and collecting secondary information obtained through project reports, books, research journals, newsletters and websites.

Through her work in Sarvodaya the author of this thesis became personally involved in village development and implementing education programmes within an eco-village community. She was readily able to define the extent to which the community engaged in educational activities and the level of incorporation of concepts regarding sustainability within the village. The majority of the data relevant to Damniyamgama were gathered from conducting in-depth interviews with the Sarvodaya officers, formal and informal discussions with community members, visitors, outside resource persons and direct observations in the village. In addition, some were collected from organisational officials and from secondary sources such as websites and project reports.

Similarly in Findhorn eco-village, the data were primarily obtained through in-depth interviews, formal and informal discussions, direct observation of various activities and from secondary sources. The author of this thesis visited the Findhorn eco-village and activity sites during her stay in the UK, conducted in-depth interviews, observed programme activities, and examined village infrastructure and management. The collection of data from the Findhorn eco-village began by first contacting the organisation to be studied in order to gain their cooperation, explaining the purpose of the study, and assembling key contact information. The visit to the Findhorn eco-village was undertaken in June 2007 and it was arranged through an employee of the Findhorn Foundation who worked as a lecturer specialising in education for sustainable

development courses. Personal interviews, site visits and participation in programme activities were scheduled by this lecturer according to the researcher's request. Observations were recorded in field notes and formal interviews were tape-recorded. Overall, participants were enthusiastic and had prepared for the interviews, thus enabling the collection of information. Numerous informal conversations were held with several community members and data were recorded in field notes. Secondary data were collected through copies of hands-outs, books, unpublished documents, journals and from the Findhorn eco-village website.

6.4.1 Pilot study

A pilot study is a small-scale version of the real thing, a 'try-out' of what is proposed, so that its feasibility can be checked (Robson, 2002: 185). In this research work, the author had prior experience of interviewing within an eco-village setting. She was thus able to undertake the research without conducting a pilot test.

6.5 Description of data sources and processes of collection

6.5.1 Interviewing as a process

As explained, the majority of the data for the study were collected by means of interviews. Robson (2002) suggest that interviewing as a research method typically involves the researcher asking questions and hopefully, receiving answers from the people who they are interviewing. Hence, interview techniques are used to gather qualitative information and opinions of people, their context, implementation, results and impact. The need for data collection to investigate the process, experiences and feelings of the staff and community members is one reason why interviews were considered to be so important. The author used face-to-face interviews for collection of data, because this helped to establish a rapport and trust between the interviewer and participant, and ultimately provided abundant data. Interviews were undertaken in depth

for the areas where detailed attention was required. As explained, the interviewer adjusted the order of the questions detailed above where this was considered to be appropriate. Additional questions were posed as needed. It was considered essential for this research work to incorporate in-depth interviews with the persons who have direct knowledge and experience about the process in order to understand the concept and history of developments. A further advantage of using in-depth interviews is that a wide range of data can be collected. In this research project, the author selected a relatively small sample size under the purposive sampling technique because of time and cost limitations. With these constraints, the use of in-depth interviews was considered to be appropriate. (Conducting in-depth interviews,

<http://www.wallacefoundation.org/wallace/wb/workbookeindepthinterviews.pdf>)

Published criticisms of in-depth interviews reflect the fact that the sample size is usually small and does not use random methods to select the participants. Subsequently, the results may not be generalised (Evaluating socio economic development, <http://www.evaled.com/page.aspx?id=mth54>). However, the author of this thesis was able to ensure that the sample populations were selected to include people with appropriately different backgrounds and experiences. Interviews were also recorded on tape and careful notes were taken in order to capture the meaning of what was being expressed.

Negative aspects of interviewing are detailed by Yin (1994, in Birch, 2003). These include potential risks associated with generating biased responses if interviews are poorly constructed. The questionnaire outlined in section 6.5.2 demonstrates how interview questions were directly related to the overall research aims of this thesis.

Interviewing the sample population in Damniyamgama was more convenient, because the author personally knew all the people who were involved with the project. The

collaboration with a friend of the author who lives in Findhorn eco-village ensured that she was able to develop a much more honest and open relationship from the beginning and felt very comfortable conducting formal interviews during this process. Before beginning the interviews the local resident introduced the author. The author then explained the purpose of the interviews, gave assurances regarding confidentiality, allowed the interviewee to ask questions and asked permission to tape and/or make notes. The interviews that were conducted took between thirty minutes to one hour to complete.

6.5.2 The interview questions

The overarching method and approach to data collection for the case studies was qualitative. The author collected data relevant to all possible things that people in the eco-villages might be expected to know and be able to articulate. An open ended questionnaire was prepared and was used as a starting point for all of the in-depth interviews. Yet conversation was allowed to flow in whatever direction was helpful in providing insights and understanding. As explain by Robson (2002), in an open-ended interview, the researcher can ask for the informant's opinion on events or facts. This could serve to corroborate previously gathered data. In both case studies, the author of this thesis was familiar with the situation and could rely on previously gathered data. Nevertheless, open-ended questions are very useful for further strengthening and clarifying of previously collected data. Other advantages of open-ended questions are that they are flexible enough to allow for going into greater depth, clearing up any misunderstandings and they encourage co-operation and rapport, (Robson, 2002: 274). To this end the researcher used probing questions such as "what else?" and "what does that mean?" in order to clarify or expand upon earlier responses. When the author required further reasons or evidence she always tried to avoid asking "why?" because this might be construed as being inflammatory, rude, or having unpleasant associations.

For example, instead of, “why do you prefer to live in eco-village?” she asked, “What are the major reasons for your preference for living in the eco-village?”.

Open-ended questions were divided into three categories under sub-headings of; ‘background information’, ‘application of the concept of sustainable development’ and ‘education for sustainability’. Six staff members from each organisation were selected for the purpose of inclusion in the sampling groups. Two shared the same background knowledge and were able to answer the same questions that appeared in different categories in order to help ensure the reliability of the research. When selecting these six people for in-depth interviews, consideration was given to people who had more experience about the development and functioning of the village, knowledge of concepts about sustainability and its application, as well as people who were directly involved in educational programmes. However, some questions that fell onto other categories were repeated with others, wherever relevant additional information would help ensure accuracy.

The open-ended questionnaire commenced with first stage interview questions which focused on getting a sense of the organisation and background of the village, the process of development and village management and experiences with development. The second stage interview questions focused on incorporation of sustainability concepts within the village, such as using of renewable energy, organic farming, waste recycling and water conservation and sustainable economic and transportation practices. In the case study in Findhorn a separate formal interview was held with one of the managers who initiated the eco-currency, in order to gain an in depth understanding about the local exchange and trading system, which is not present in Damniyamgama eco-village. Third stage interview questions focused on the role of education in both eco-villages, diversity of the participants and the impact of the educational events.

A final group of simpler questions was asked within formal and informal discussions amongst community members, staff members, visitors and volunteers. These included questions as to how and why they had joined the eco-village, their perception about the eco-village and to what extent the eco-village had met their prior expectations. People were encourage to discuss their views on such matters as the opportunities for community inter-actions, their participation in community meetings/educational programmes and cultural events, how they related to it personally and in their lifestyles, and how they appreciated the sharing of pro-environmental knowledge and values.

By way of summary, the following subject areas were covered using open-ended questions in order to address this study's overall aims.

First stage interview questions: background information

1. Background of the organisation

- i. About the Sarvodaya Shramadana Movement/ Findhorn Foundation
- ii. Organisational structure
- iii. Collaboration with other organisations, such as government, non-government and private sector, etc.

2. Background of the eco-village

- i. Foundation date
- ii. Reasons for starting of eco-village development project.
- iii. People who initiated the concept (developers/project team)
- iv. Process of development
- vi. Project vision, mission and objectives
- iv. Location of the eco-village, ownership for the land: community, government or private ownership
- v. Information about operation and maintenance of the village

- vi. Community meetings, cultural activities organised in the village and community participation
- vii. Decision-making processes
- viii. How do people join and leave? Selection process?
- viii. Constraints and challenges faced

Second stage interview questions: application of concepts of sustainable development

- i. Available infrastructure
- ii. Strategies applied for sustainable infrastructure development. For example;
 - Building construction
 - Water conservation strategies such as rain water harvesting, waste water recycling (grey water recycling)
 - Strategies for energy conservation: solar power, wind power, bio-mass energy
 - Waste recycling: compost making, recycling of non degradable solid waste
 - Information about organic farming and agricultural practices
- iii. Economic sustainability: main livelihood options for the community
- iv. Eco-currency- applicable only to Findhorn eco-village
 - When was the eco-currency introduced to the community?
 - What are the consequences of using an eco-currency and how it is functioning within the village?
 - Objectives of introducing eco-currency

Third stage interview questions: education for sustainability

- i. How the education system is integrated within the community: education for the community and outside the community

- ii. Topics and content of the education programmes undertaken within the year, information about the participants (such as within community, local and global participation, age groups, nationality, etc)
- iii. Impact of environmental education programmes that raise environmental awareness of sustainability issues within the community and outside the community.
- iv. How the environmental education effects the wider community and increases their knowledge and attitude about the environment

6.5.3 Documentation and secondary resources

As another part of the data collection process, the author collected a variety of documents and secondary resources including books, project reports, e-mail communications, journals, web publications, newsletters, brochures and annual reports. Yin (1994, in Birch 2003) explains that documentation is helpful to the case study researcher, providing 'stable' information with precise details. A further advantage of using documentation is that it is also able to cover a broad set of contexts. The chief purpose behind using other materials provided at Findhorn was to support the author's understanding of the interview discussions, for example to clarify the organisational structure and nature of educational programmes. In Damniaymgama, documentation included the demographic data, project reports and evaluation reports. As Stake (2000) suggests, the use of documents to support interview data is intended to 'reduce the likelihood of misinterpretation' and use 'multiple perception to clarify meaning'.

6.5.4 Personal researcher observations

The author was able to make additional observations during the site visits by engaging in some of the programmes with community members. Creswell (2002) defines participant observation as 'an observational role adopted by researchers when they take

part in activities in the setting they observe'. In the case of Damniyamgama the author of this thesis was a full participant in every interaction relating to her work with the community. During her stay at Findhorn, she actively engaged in a variety of activities in the village.

6.5.5 Field notes

Field notes provided yet another source of data. These include records from formal and informal discussions, general impressions, and notes made during participation in the programmes. The author took notes of her observations and respondents' answers. A primary reason to make written field notes was to identify particular issues and areas that needed to have further clarifications.

6.6 The data analysis process

Analysis is a test of the ability to think and to process information in a meaningful and useful manner (Robson, 2000; 459). Yin (1994, in Birch, 2003) argues that, the analysis of a case study is one of the least developed aspects of the case study methodology. The researcher needs to rely on experience and the literature, to present the evidence in various ways, using a number of different interpretations. In this research project, the author's field experience of both eco-villages greatly helped in the analysis of the data.

The initial process of data analysis was one of data organisation and it was an ongoing process throughout the implementation of each case study. This later enabled the researcher to write-up detailed case studies for each eco-village. After completing the empirical research for both case studies, the author had accumulated large volumes of data: including all the secondary resources described, notes and the transcripts of interviews. In each case the author analysed observations, interviews, field notes and documents to develop a description of the situation. Data obtained from various sources were categorised under sub-headings for the purpose of cross-checking and then



formulating ideas around the main research aims and questions of this study. By doing this, the author could move the data through the research process. Based on the literature and categories and themes that emerged while conducting and analysing the interviews, the author was able to create a structure, to organise and think about patterns of the data.

After completing the within-case analysis, the author focused on the cross-case analysis to address the comparison of the two cases. In the cross-case analysis, the author used data from both case studies to address the following questions: What are the similarities and differences in the eco-village management, infrastructure development, social interaction, education programmes? What kinds of issues arise, when implementing a community-based environmental educational programme? What are the transferable outcomes of one or both case studies?.

Chapters 7 and 8 present the Sri Lanka and the UK case studies. Chapter 9 contains cross-referencing of data analysis, research aims and previous research findings. As a result, the data no longer sit only within the bounds of educational activities. This allows the reader to develop an understanding of this work within a broader context.

6.7 Data presentation

Display, or presentation of the data is different from the analysis of data, but it is clear that there must be a close link. A key role of data display is to ensure that data is not misrepresented, or distorted (Denscombe, 1998: 190). The data analysed and presented in Chapters 7 and 8 of this thesis are separated into following groups: organisational background, eco-village development, structure and functioning, incorporation of sustainability concepts in to eco-village setting and the educational role. However, the order in which the sub-headings in both chapters appear, include a slight deviation for the purpose of making the material more understandable to the reader.

6.8 Methodological issues and limitations

6.8.1 Objectivity and Subjectivity

Objectivity is often regarded as a goal of empirical research. Objectivity is considered by Miles and Huberman (1994, in Birch, 2003: 139) to be linked to the quality of 'confirmability' found in research that is free from the researcher's bias. This study tackled the issue of objectivity by firstly noting that the reality investigated by one researcher's empirical study often contains an element of subjectivity. (Birch, 2003: 139). Peshkin (1988) defines subjectivity as 'the quality of the investigator that affects the results of observational investigation'. Furthermore, the author points out that an individual's subjectivity is not something that can be removed, and it is therefore something researchers need to be aware of throughout the research process. The author of this thesis was aware of how these subjectivities could influence her data interpretation and description. The author also believes that prevention of certain biases was possible for this study and where they were not prevented, recognition of personal biases was beneficial and not necessarily problematic. The subjectivity that the author brought to this research was from her previous experience with the eco-village project in Sri Lanka. As the author was involved in the eco-village project before commencing work on her thesis, she already had a perception of how the process works.

6.8.2 Researcher reflexivity

Horsburgh (2003) explains reflexivity as referring to the 'active acknowledgement by the researcher that her/his own actions and decisions will inevitably affect upon the meaning and context of the experience under investigation'. Hence, during the data collection process the author sought to maintain a heightened sense of awareness of how friendliness and humour during any interview could influence the data, sometimes in a

positive, or negative sense. The author maintained her awareness of this, when adding data to field notes, observations and interview transcriptions.

Reflections were made in accordance with the suggestions of Hart (2000: 43) who highlights the importance of the researchers' personal history, class, ethnicity and assumptions. It became apparent that the author's attitudes closely conformed to those of the participants in the case study in Sri Lanka. This is unsurprising, as the author is Sri Lankan, middle class, interested in the environment and has working experience in the Sri Lankan eco-village. Hence, these characteristics of the researcher could be considered helpful in gaining easy interview access and potentially good interview rapport. In the case study at Findhorn, the deviation of nationality and being a new member to the community was overcome by the help of the author's friend who lives in the eco-village and has a clear interest in and experience of eco-village living. Before the beginning of each interview, her friend would make a clear introduction about the author and this was very useful for building a good rapport with interviewees.

6.8.3 Ethical research

Case studies customarily involve a process of making appropriate decisions regarding disclosure of the case being studied. For these two case studies, the eco-villages and related organisations were responsible for the overview and 'authority' of the villages. They gave their permission to undertake the research. Before individual interviews took place, participants were presented with verbal information about this research work, that it was for a M.A. and that an opportunity would be given to each interviewee to ask any question from the author. Permission was also sought to make any audio-recordings, or note taking. No participants' real names are used in the thesis. This study aimed to secure good relationships with participants for ethical purpose and no problems occurred during data collection.

6.8.4 Contaminating variables

This study seeks to compare two cases of community-based environmental education. However, there are differences between the two experiences that may have affected the findings of the study. In the author's work with the Sarvodaya Shramadana Movement she was actively engaged with eco-village development project in Sri Lanka. The fact that she was a previous employee in the first case study, but in the second case study, was completely independent, may have had an influence on the data collection processes.

Visit to each eco-village were limited by time, financial and geographical boundaries. This challenge was overcome by arranging to contact individuals after each interview. Follow-up e-mail interviews were undertaken with staff members in both villages after beginning the process of data analysis.

6.9 Methodological strengths

6.9.1 Use of triangulation

Guion (2002) explains that triangulation is a method used by qualitative researchers to check and establish validity in their studies. Yin (1994) suggests case studies demonstrate triangulation through use of multiple sources of evidence. For this research project, the author employed methodological triangulation by employing multiple sources of evidence: formal and informal interview, in-depth interviews and field observations as well as secondary documents and field notes.

Stake (2000) suggests that triangulation means 'a process using multiple perceptions to clarify the meaning, verifying the repeatability of an observation or interpretation and it serves to reduce the likelihood of misinterpretation'. Yin (1994) proposed that a useful triangulation technique is the use of different evaluators, or researchers. However, in

these two case studies, it was only the author who was used as a single source for both collecting and analysing the data. The use of a single researcher, taking the role of the interviewer, was of benefit to this study, because the author is the person who also constructed the questionnaire, since she was in the best position take in to account the subtleties of the interview (Baxter and Eyles, 1999).

6.9.2 Demonstration of validity

The validity of any work is associated with how well a study addresses the questions it intends to answer, giving a true picture of what is studied. Validity is also thought to be linked to the notion of credibility (Maxwell, 1996, in Birch 2003: 144). It is intended that the validity incorporated in this study demonstrates particular attention to credibility, that is to say 'the degree to which a description of human experience is such that those having the experience would recognise it immediately and those outside the direct experience can understand it' (Lincoln and Guba, 2000, in Brich 2003: 144). Chapter 9 of this thesis makes a number of comparisons, by cross-referring between Chapter 7 and 8, thereby offering a means for validating the study findings.

6.9.3 Demonstration of reliability

The author asserts that the reliability of this study was enhanced by the consistency provided by having a single researcher carry out the data collection and analysis. This means that the study would be most likely to give the same results if the research process were repeated. Furthermore, the reliability of data collection was improved through use of open-ended questionnaires and in-depth interviews. In addition, reliability was further strengthened by repeating the same questions with two individuals who had similar background knowledge.

It is believed that given the constraints of time and length imposed by an MA study, the case study method employed may be defended as the most effective and reliable approach.

Chapter 7

Case Study of Community-Based Environmental Education in Sri Lanka: Damniyamgama Eco-village in Kalutara

Author's note

As discussed in Chapter 6, personal interviews were a fundamental element of the data collection process. Direct quotations from these interviews which provide corroborative evidence of analysis described in the case studies are included in italicised text in both Chapters 7 and 8. All are direct quotations and so are not corrected for English grammatical accuracy. By inclusion of these, the case studies are grounded in empirical evidence.

7.1 Introduction

The Lanka Jathika Sarvodaya Shramadana Movement is the largest non governmental organisation in Sri Lanka. This organisation implemented the eco-village development project under its overall tsunami reconstruction programme. The overall development objective of this recently constructed eco-village at Sri Lanka was to test an innovative model that is environmentally friendly, operationalises participatory planning at village level, and empowers communities to take effectively their own decisions thus leading to environmentally sustainable development and education.

"Before starting the construction several meetings were held with the participation with resource persons from international and national. The ways and means of incorporation of sustainable design practices were discussed in those meetings and

came up with the ideas to include permaculture principles, affordable housing, waste management, water conservation,, economic development, and upfront community development. ”

Sarvodaya staff member

The Sarvodaya eco-village development project considers various aspects of sustainable development which can be incorporated in normal life styles. Some of the goals of the project are to include a complete range of sustainable design practices and strategies. These include the use of permaculture principles, affordable housing, waste management, water conservation, economic development, and upfront community development.

Damniyamgama eco-village is a housing development in Kalutara in Sri Lanka where energy, waste treatment, water, and food production are provided on site. Energy needs are met by solar and national grid. Water is supplied by rainwater catchments and wells; wastes and nutrients are recycled and treated as resources. The landscape is full of edible and useful plants and annual vegetable production and perennial fruit production are integrated into the project. The Damniyamgama eco-village is a leading example for sustainable living practices for not only Sri Lanka but also for all around the world. Yet it was a very challenging project when it was started because it was a pilot project, and also because construction was undertaken in a very challenging environment.

This case study examines the ways in which residents are connecting both with the environment, through developing a relationship with the natural world, and also with each other in a community which is facilitated both by the physical design of the eco-village, and by the practices that the community has adopted. The account describes the organisation, design, initial stages of construction and operation and maintenance of the

project, and then examines the role of this village in community-based education for sustainable development.

7.2 The village

The village, named Damniyangama, hosts 220 people in 55 families. All are tsunami survivors in the Kalutara district of southern Sri Lanka. The village is designed as a model of participatory development towards environmental sustainability. Placed on a five-acre plot provided by Sri Lankan government, the village features 55 eco-friendly houses, a multi-purpose community centre, a playground, an ample supply of water, a comprehensive road network, and expansive green areas. The houses and the community centre are equipped with solar panels for electricity. They receive water through five drinking wells and 14 rainwater harvesting tanks. The village also incorporates a sub-terra system, a natural method for waste water treatment, and a recycling facility for solid waste materials. Each house consists of two bedrooms, a living room, a kitchen, and sanitation facilities that altogether encompass a space of 500 square feet. The houses were built according to the United Nations Environmental Programme (UNEP) guidelines for construction of eco-houses in tsunami-affected areas in Asia. Construction commenced in March 2005 and was completed in March 2006.

“After the tsunami many discussions were undertaken respecting construction of resettlement schemes. There was a conference hold by UNEP regarding development of eco-houses for tsunami affected families. In that conference Sarvodaya took the decision to construct this eco-village. However Sarvodaya is a partner of GEN before starting the construction of this eco-village and Sarvodaya is one of the main NGO in Sri Lanka take part in environmental conservation throughout the country.”

Deputy Executive Director, Sarvodaya Shramadana Movement

Different donor agencies such as United Nations Environmental Programme (UNEP), Asia-Pacific Forum for Environment and Development (APFED), and the American Jewish Joint Distribution Committee (AJJDC) gave the financial support; however the Sarvodaya NGO contributed as the main funding source for village development. In the initial stage, the consultancy firm Ecological Solution gave an active contribution for planning and design of the eco-village. Most importantly, ideas came from the community because it is a participatory development project.

“Due to tsunami disaster Sarvodaya got funding support from individual people and organisations. Those funds were mainly used for construction of the village and other than that UNEP supported for purchasing of solar panels, APFED was the main donor for regeneration of vegetation cover and AJJDC contributed for construction of multipurpose centre.”

Deputy Executive Director, Sarvodaya Shramadana Movement

Necessary approval was gained from relevant government agencies for the construction of an eco- village on the selected land. Then through training, education, information sharing, courses, and community interaction the Sarvodaya organisation worked on development of social infrastructure that was to become an essential part of the village.

7.3 Lanka Jathika Sarvodaya Shramadana Sangamaya

Before moving on to further discussion of the eco-village, it would be appropriate here to provide further details of the Sarvodaya NGO which is responsible for this project.

The Lanka Jathika Sarvodaya Shramadana Sangamaya is the full legal name of this Sri Lankan NGO which has a unique philosophy and strategy for development. Dr. A. T. Ariyaratne, then a school teacher in Colombo founded the movement in 1958. In 1972 the Sarvodaya Shramadana Movement was incorporated in Sri Lanka by an Act of Parliament.

The name Sarvodaya derives from two Sanskrit words: ‘Sarva’ means universal and ‘udaya’ means awakening. The word Shramadana also comes from two Sanskrit words: ‘Shrama’ means labour and ‘dana’ means sharing. From early beginnings in a rural village it has grown to encompass more than 15,000 villages throughout the island.

Figure 7.1 shows the hierarchy of the Sarvodaya Shramadana movement and the place of district, divisional and village organisation within this.

(Sarvodaya, <http://www.sarvodaya.org/about/>)

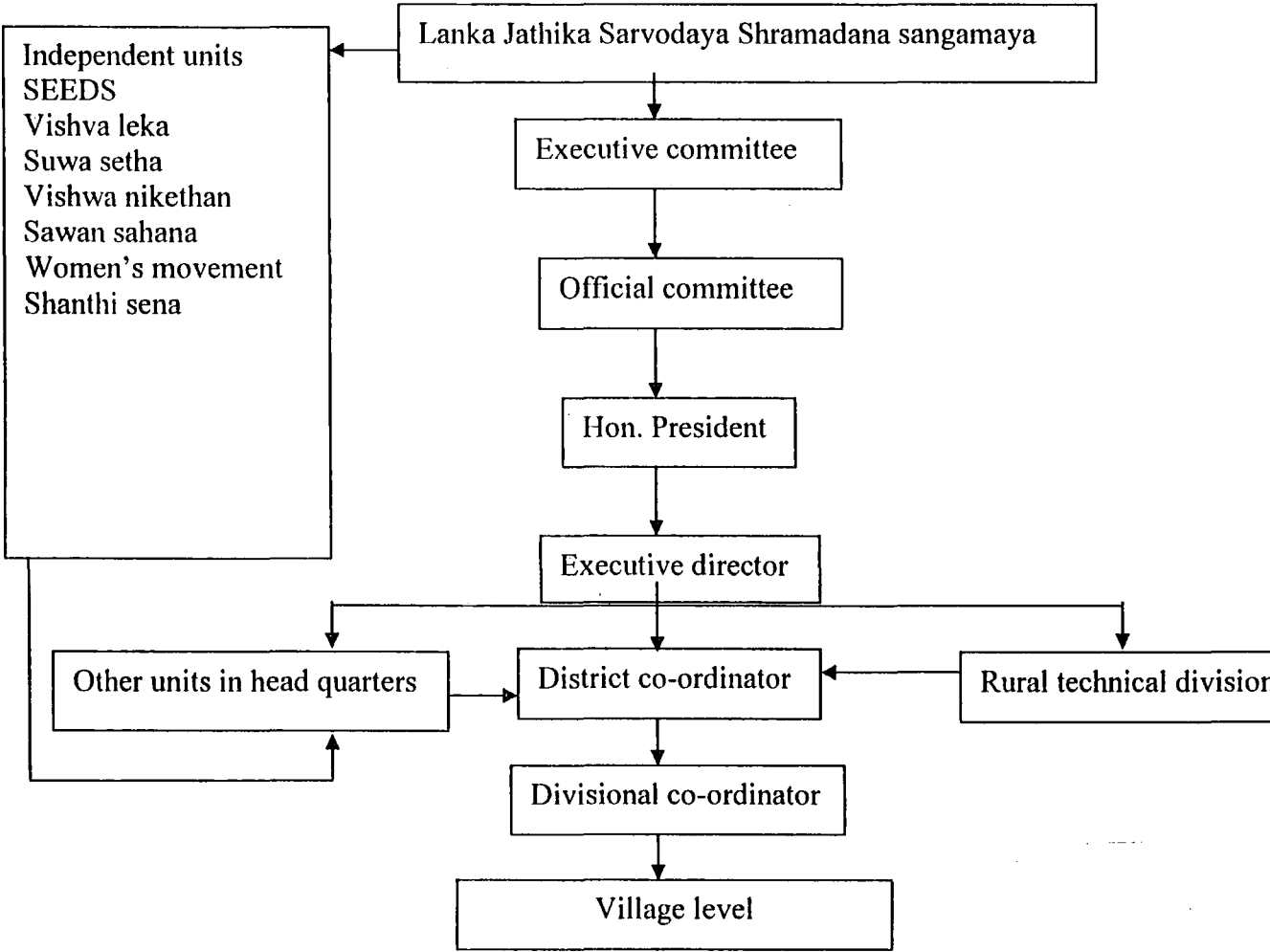


Figure 7.1 Hierarchy of Lanka Jathika Sarvodaya Shramadana Sangamaya, (Sarvodaya, <http://www.sarvodaya.org/divisions/>).

The Sarvodaya movement seeks a no-poverty, no-affluence society based on the sharing of resources. An aim is to uplift the status of the poorest in the country. Projects start with the poorest people, and achievements are measured by socio-economic development as well as human transformation. The Sarvodaya movement is a people's development organisation that has an integrated strategy, which includes the development of social, cultural, moral, spiritual, economic and political dimensions. It works with people, encouraging them to come together and share their own resources to address the needs of the community leading to self-reliance, not only for the individual but also for the community. The movement works with the 'bottom up' grassroots approach. All of its work originates in the villages, implemented by village people who have received training from the district Sarvodaya office in a wide variety of skills. Its methods are designed to preserve the traditional Sri Lankan values and culture while simultaneously promoting national peace in a nation suffering from civil conflict.

"Sarvodaya is a movement which promote human development. The uniqueness of the Sarvodaya lies in the fact that it promotes inner connection between people and communities. Which we call spirituality which is the glue which keep this holistic approach together."

Executive Director, Sarvodaya Shramadana Movement

This NGO has identified ten elementary and basic needs for developing human potential in the Buddhist sense; a clean and beautiful environment, adequate provision of clean drinking water, minimal supplies of clothing, adequate and balanced nutrition, simple housing, basic health care, basic communication facilities, a minimal supply of energy, holistic education, and satisfaction of intellectual and cultural needs.

Based on its extensive field experience Sarvodaya has developed a five-stage model of village community development. The First Stage is that of psychological infrastructure building. It begins quite simply with a village level discussion about local needs and organising self-help activities. Villages enter the Second Stage of social infrastructure building when they have formed one or more community groups of; farmers, mothers, children, youth and elders. The Third Stage of the Sarvodaya development process is a very critical one. At this stage the village is organised to satisfy its own basic and secondary needs. It is at this stage that water and sanitation related programmes are initiated. In addition the village Sarvodaya groups are brought together and institutionalised as a legally incorporated body (the Sarvodaya Shramadana Society) which is entitled to open its own bank account, obtain loans and start economic activities with support from district level and national level Sarvodaya structures. Villages in the Fourth Stage are expected to become self financing in their Sarvodaya activity and in the Fifth Stage they engage in outreach assistance in neighbouring villages.

Sarvodaya villages operate within the framework of a model of 'moral education for environmental protection'. This is based on traditional Asian cultural values and differs from isolated, material-oriented development models. The Sarvodaya model emphasises balanced sustainable agriculture based on eco-friendly farming practices; further, it promotes practices conducive to sustainable natural resource management.

Within the villages, five groups work according to this model with associated programmes. These groups are pre-school, children, youth, mothers and farmers.

7.3.1 Pre school groups

The rural Sarvodaya centres try to care for these children and duly consider their nutritional state, health, education and mental well-being as well as sociability. The

children have opportunities to recognise and perceive the relationship among them and between them and the environment and culture. This is achieved through structured fancy stories, small dramas and other activities. They observe the streams, sky, soil, trees, sun, moon and the clouds. The children are assisted in personality development and in becoming environmentally conscious.

7.3.2 Children's groups

Members of these groups are children who are receiving formal education. They initiate and engage in tree planting, maintaining small home gardens, soil conservation, repair of small irrigation systems and group savings. They are encouraged to interact with other groups (youth, mothers and farmers). Sometimes they join or organise shramadana activities. Such activities enhance their environmental awareness and promote education and understanding.

7.3.3 Youth groups

This group consists of young people who are relatively mature, knowledgeable and responsible. They may be more active in environment protection than other groups. The majority of the group members have completed their formal education (G.C.E. Ordinary Level or G.C.E. Advance Level). Some of their activities may include collecting planting materials, tree planting and participatory environmental protection programmes. Some of them may receive organic farming training at the Tanamalvila Centre. There they learn natural pest control methods, ecological farming techniques, sustainable farming technology, reforestation and watersheds management.

7.3.4 Mothers' groups

At the village level the mothers' groups are dynamic and the most powerful of all Sarvodaya groups. They are trained in child care, tree planting, moral and spiritual

development, family nutrition, home economics, sustainable farming practices, post-harvest technology of food commodities. Training helps them to integrate newly gained knowledge with traditional knowledge and pass on their experiences to their children.

7.3.5 Farmers' groups

The elders of the village are in these groups. They are there to provide mature advice. They assist youth groups regarding aspects of environmental conservation, water supply, food production, housing, health, communication, energy and education.

These five groups meet separately as well as collectively according to the needs of their own villages. They may meet together as a 'pawul hamuwa' (family gathering). Such meetings would take place at the village Sarvodaya centre weekly or monthly depending on necessity (Herath, 1998).

This village structure underpins that of the case study model village, to which we turn after a brief reflection on the tsunami natural disaster that impacted on southern Sri Lanka in 2004. This disaster is directly relevant to the development of the model village as will now be explained.

7.4 Tsunami impact

The tsunami of 26th of December 2004 struck a relatively thin but long coastal area stretching over 1,000 kilometres, or two thirds of the country's coastline. Sri Lankan authorities reported 30,196 confirmed deaths by January 2005 after the island was hit by the tsunami. The south and east coasts were worst hit. An estimated one and a half million people were displaced from their homes (Tsunami Magnitude of terror http://library.thinkquest.org/04oct/01724/effects_srilanka.html).

7.4.1 The Sarvodaya response

After the tsunami the Sarvodaya NGO undertook intensive re-vegetation programmes along the coastal belt alongside community environmental awareness programmes. Under the environmental management programmes re-vegetation of the coastal belt was carried out by community participation. Sarvodaya provided inputs for re-vegetation and planting and delegated maintenance to the community.

"Intensive re-vegetation programme was undertaken along the coastal belt after the tsunami. Seedlings were provided by the Sarvodaya and planting and maintenance was undertaken by the community. However payment was given to the community because it was a requirement to uplift the living standard of the tsunami affected people in that time. People were highly motivated for the regeneration programme because of they were realised that coastal plants act as an effective barrier for reduce the detrimental impact of the tsunami."

Sarvodaya staff member

In order to get the active participation of the community Sarvodaya NGO undertook several awareness programmes to build positive attitudes of the people towards environmental conservation. Such programmes are still being implemented and one of the major ongoing environmental projects being implemented is 'strengthening the resilience of tsunami affected families'. Under this project re-vegetation and community-based environmental programmes are taking place in 12 tsunami affected villages in four districts in Sri Lanka. Project partners are the communities themselves, Sarvodaya NGO, the Forest Department, the Ministry of Environment, the Canadian International Development Agency and the International Development Research Centre.

7.4.2 Eco-village development in the context of the tsunami

After the tsunami there was an urgent need to ensure that post-tsunami reconstruction did not do further damage to the environment.

Sarvodaya adopted basic guidance principles for development laid down by the International Union for Conservation of Nature and Natural resources (IUCN). These are:

- Reconstruction according to sound land use principals. That is, reconstruction based on minimum land use and minimum environmental impact at acceptable cost.
- Follow proper building design and construction practices, including and respecting relevant government laws and principles.
- Environmentally friendly alternatives should be used as raw materials wherever possible for reconstruction.
- Ensure that from the beginning, government agencies, local communities, local and national NGOs integrate environmental concerns into reconstruction.
- Recruit affected communities for the reconstruction, thus providing alternative livelihoods and immediate sources of income. (Series of best practice guidelines, Sri Lanka <http://www.iucn.org/tsunami/docs/ip-materials-reconstruction.pdf>)

For many years Sarvodaya has had experience of responding to natural disasters such as floods, droughts and landslides. It has the infrastructure to deal with disasters of this nature although nothing of the magnitude of the tsunami had been seen in Sri Lanka before. With its unique structure of 35 district coordinators and 360 divisional coordinators the organisation was well placed to act at grass root level.

Hence, because of massive destruction brought about by the tsunami Sarvodaya NGO began to start the construction of permanent houses for tsunami affected families under the tsunami reconstruction project. Under these reconstruction projects Sarvodaya decided to implement its eco-village project in the Kalutara district as a pilot with the hope of replicating it for future developments. Figure 7.2 shows the location of Kalutara on the island of Sri Lanka.

7.5 Kalutara

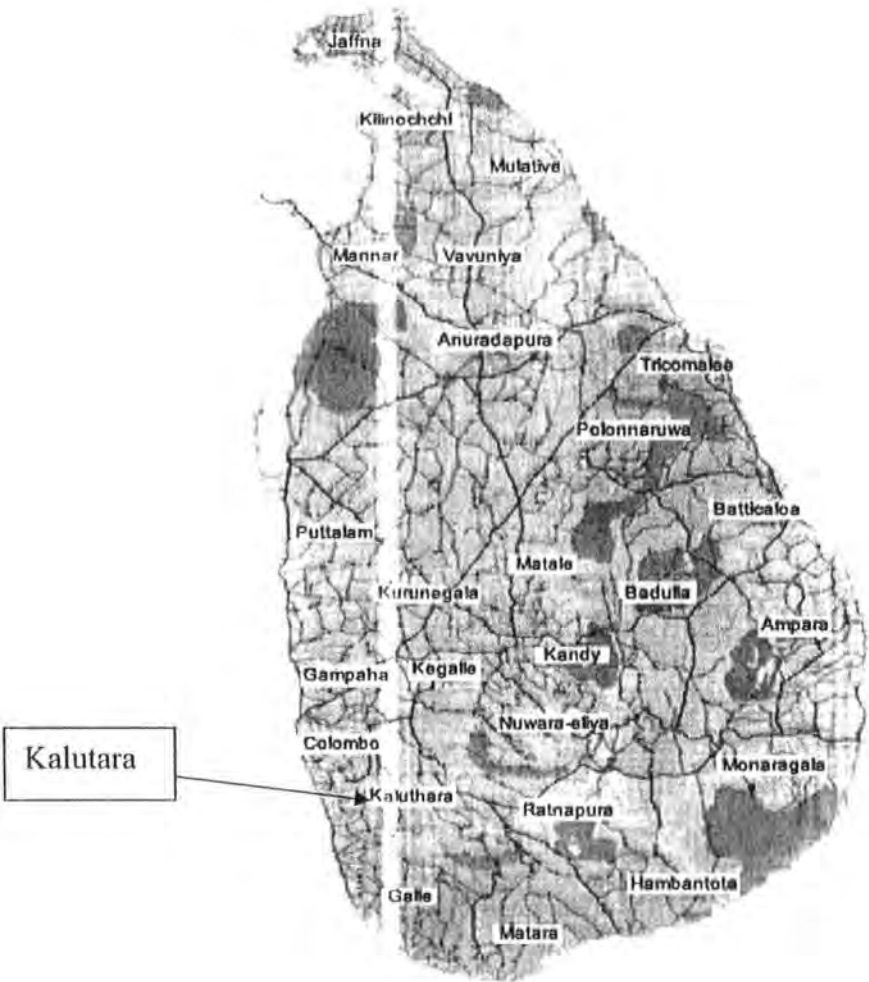


Figure 7.2 Sri Lanka Map (<http://www.mysrilanka.com/travel/lankamap/>)

Kalutara is a semi-urban town located approximately 40km south of Colombo (see figure 7.2). The 38-meter long Kalutara bridge was built at the mouth of the Kalu Ganga

River and serves as a major link between the country's Western and Southern borders. On December 28th 2004, official statistics compiled by the Sri Lankan government tabulated 35 deaths and approximately 3,000 displaced in the Kalutara area.

(Asian Tsunami Imagery - Kalutara, Sri Lanka

<http://www.globalsecurity.org/cye/andaman-sri-lanka.htm>).

7.6 The eco-village Damniyangama: context, aims and commencement

As previously mentioned, the total population in the eco-village is 220 and the number of households is 55. Main occupations of the residents are fish merchants, carpenters, masons, labourers and drivers. The majority of the residents are Sinhalese. One family within the village is Tamil. Although the majority of the population is Buddhist, there are also Roman Catholics and Hindu people in the village.

"Our village consist of people from different ethnic and religious background. Although we have different spiritual and cultural practices all of us get together as a community for organising events which is unique to each religion or ethnic groups."

Community member

"When selecting the people for eco-village we paid more attention towards the occupation of them. Because majority of the tsunami affected people were fisherman's. But it was decided to select people from other occupations just because the village is situated 5 Km away from the sea."

Sarvodya Staff member

Prior to re-settlement in the eco-village these people lived in the urban coastal belt in Kalutara district. Villages on this urban coastal belt are often populated by low-income groups of skilled, semi-skilled labourers and small businessmen such as fish vendors, and small shop keepers. Their housing is dense, ramshackle, shanty-like and under

serviced by municipal authorities. As a result these people were living in an environment that was dirty, disease prone and unhealthy. Some of the houses were built illegally on the coastal rail track or on river reservations.

"Before tsunami we lived at small house near to the beach and we had loss everything due to tsunami. After that we moved to the temporary shelters and life of the temporary shelters extremely hard. During that time Sarvodaya officers visited our camp and we also participated the community meetings arrange by the Sarvodaya. They listened to us and took our opinion about the new development and we also participated for the construction of our houses as labours and supported all possible ways. We've also learned a lot about group process and decision making. In addition, we've become much more environmentally aware. After completing the project we have got our own house with beautiful environment. So I'm lucky to be a member of this community."

Community member

The vision of Sarvodaya for its eco-village was the development of a self sufficient ecological way of life that a group of people of similar intention can embrace. In so doing they share resources and serve as an ecological centre for ecological resources. As a community they protect our planet, raise awareness of sustainability and promote understanding of it.

The overall development objectives of the pilot were to test an innovative model that is environmentally friendly, operationalises participatory planning at the village level, empowering communities to take effectively their own decisions thus leading to environmentally sustainable development. Other stated objectives were:

- Resettlement of the tsunami affected families in the security and beauty of a productive garden.
- To build a sustainable environment for living which promotes environmental awareness among residents and encourages public participation in environmental initiatives.
- To serve as an educational site for future eco-village development. This involves demonstration of practices that ensure a high quality of life for village participants while ensuring locally sustainable development, conservation of bio-diversity of natural resources and self-sustainability through social, economic, geological and climatic changes.
- To empower communities to work on their own identified development needs and to take their own creative and innovative decisions with least intervention from government agencies.
- To target development programmes towards the vulnerable groups within the community.
- To leave operations and maintenance responsibilities of village infrastructure with the village communities, so increasing the efficiency of services delivery with enhanced recovery of operation and maintenance charges and user satisfaction.

The Deputy Executive Director of Sarvodaya explained that shortly following the conception of the idea to create an eco-village in March 2005, it was decided to develop a clear way forward. To assist in this process it was felt that a strategic plan should be developed. Before starting the construction, a detailed planning process was undertaken, with inputs from local and international people and institutions. Ideas from the local tsunami affected families were crucial. For example, they provided inputs regarding the type of house they need, arrangement of the houses and ecological aspects. In the

planning stage national inputs were given by the Ministry of Environment, the Urban Development Authority, Government officers in Kalutara district and other NGOs. The president of the Global Eco-Village Network in Asia and Oceania also provided advice. Construction planning was undertaken according to the United Nations Environmental Programme (UNEP) guidelines. UNEP developed their eco-housing guidelines for projects in Indonesia, the Maldives and Sri Lanka. Local architects participated in training programmes undertaken by UNEP relating to the planning and construction of eco-housing.

"Other than guideline developed by IUCN there is a guideline developed by the UNEP for construction of eco-houses. We also did consideration of both guidelines and tried our best to incorporate more environmentally friendly features within this village".

Sarvodaya engineer

Construction of Damniyamgama commenced on 5th of May 2005, on a site 5 Km away from Kalutara city. Two hectares of land were handed over by the Urban Development Authority to Sarvodaya. Figure 7.3 shows the layout plan. Housing design considered drainage and slope of land, access to sunlight and ventilation. The interests of the community lead to the choosing of desired tree species in the plan.

Selection of plant species for the village was undertaken by the author with community participation. In the planning stage a community meeting was held and initial discussion took place about the kind of plant species residents would like to have in their garden.

"we would like to have fruit species like mango, Rambutan and as well as Neem like herbs for our garden. For the road side its better to have shade trees and fruit species as well. Other than that we can grow vegetables and some spices in our garden."

Community member

This quotation shows that community members who were aware about plant species and their suitability or otherwise for the local climate were involved in the decision making process.

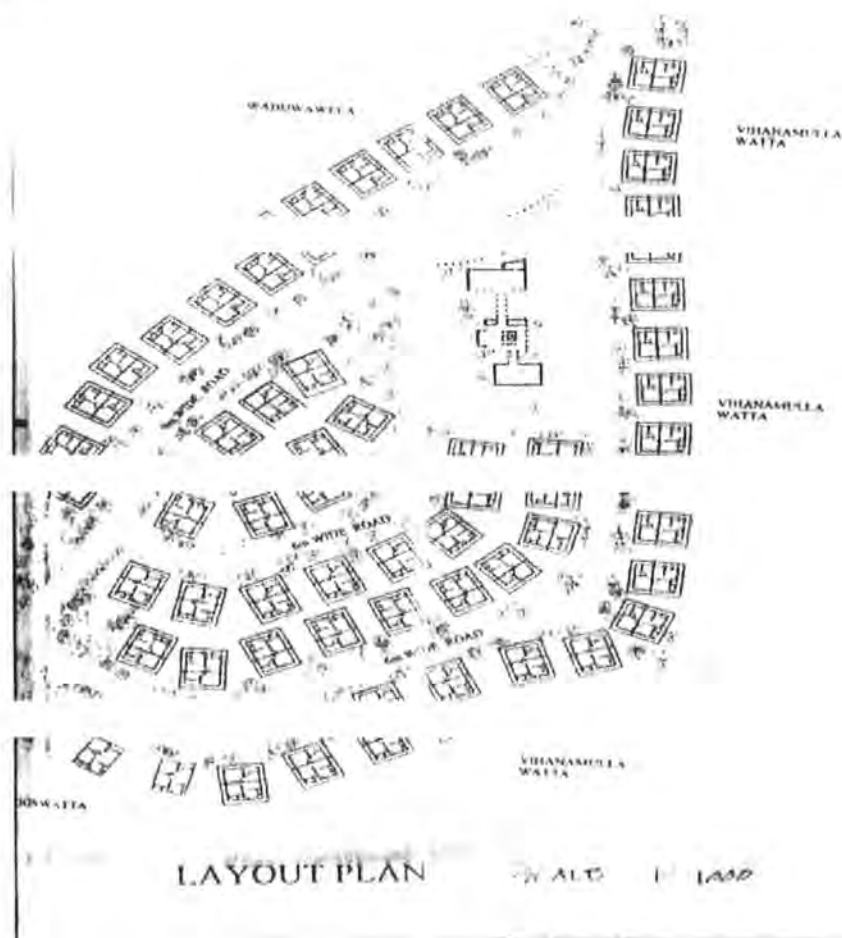


Figure 7.3 Layout plan of Damniyamgama (Unpublished document)

A director of Sarvodaya explained the challenges identified in relation to implementation of the eco-village project. For example, as construction commenced, a number of challenges and problems had to be faced. Firstly, before handover, the Urban Development Authority cleared the whole land area for surveying purpose and this created an extra burden for Sarvodaya. Replanting programmes had to be undertaken alongside re-construction. Secondly in the planning stage it was decided to use environmentally friendly materials such as earth bricks for construction. But just after

the tsunami many organisations were involved in construction and there was a huge demand for materials. Yet there was an urgent need for rehabilitating the displaced people in the shortest possible time. Hence it was impossible to wait to get the most suitable materials for construction. Thus it was decided to use earth bricks only for the multipurpose centre and use other materials for the construction of houses. Finally, the majority of the tsunami affected families were coastal communities and they were initially lacking in concern about the environmental matters, social relationships, spiritual aspects, education and health. Because of that Sarvodaya had to undertake intensive awareness programmes for the community to improve their positive attitudes.

Environmental awareness programmes were undertaken by the bio-diversity unit and included topics such as the concept of an eco-village, environmental degradation and organic farming. The social empowerment division undertook the programmes to develop peoples' positive attitudes toward the social relationships. Trainings were undertaken on topics such as conflict resolution and leadership. The objective of the social empowerment and capacity building was to build the necessary institutional and human resource competencies of the village Shramadana society so as to empower them to plan, implement and manage village development activities in an efficient, equitable and sustainable manner. Spiritual development programmes were also undertaken. The early childhood development unit undertook education programmes particularly relating to young children. The community health unit undertook programmes regarding the development of community health. The women's movement conducted training programmes for starting self-employment; for example training for hand craft production and the food processing. The legal division took a major role in providing documents such as birth certificates and identity-cards for the people who lost these important documents in the tsunami. Such programmes created a positive impact to get the active involvement of the community in the early stages. This active involvement

leads to a sense of ownership and empowerment of the community to be involved in the village.

7.7 Infrastructure and development

Alongside the 55 houses, the village was designed to incorporate 14 rain water harvesting tanks, 5 drinking water wells, 2 bathing wells, a multipurpose centre, a children's park, a volleyball court, a road network, drainage canals, waste collection bins, a youth park, a pond and a sub terraces system. Each house was planned to consist of two bedrooms, a kitchen and a living area. The multipurpose centre was designed to have a health unit, a pre-school, a computer room, a library, an office for the village Shramadana Society and a common hall for community gatherings.

"Around 20% of the property is 'common property' to be shared and managed by the community, which ensures that the essential rural character and environmental value of the site is protected."

Sarvodaya district staff member

The village offers an appropriate environment and opportunity to apply the principles of permaculture where the needs are met from within the system as much as possible. From an environmental perspective the village makes significant contributions to sustainability. Each area of land has been assessed and the best possible use has been worked out using its characteristics. The extensive re-vegetation of the site provides a 'green' framework for the features of the village such as housing, road network and the village centre. Construction was completed and the official opening of the village took place on 26th of March 2006, by the President of Sri Lanka.

Let us now explore certain aspects of the village infrastructure in greater detail.

7.7.1 Permaculture

Permaculture deals with plants, animals, buildings, and infrastructures such as the supply of water, energy and communications. It is the harmonious integration of landscape and people in a way that provides food, energy, shelter, and other material and non-material needs in a sustainable manner.

"It is a system design of integrating good housing, landscaping, organic farming, minimisation of waste and maximisation of recycling and conservation of natural resources. Within the Damniyamgama we have integrated those things in best possible ways. For example houses were designed to access more sunlight and ventilation, waste recycling was taken in to account from the beginning of the construction".

Sarvodaya Director

7.7.2 Housing

Houses in Damniyamgama are of passive design, which is a design that does not require mechanical heating or cooling. Homes that are passively designed take advantage of natural energy flows to maintain thermal comfort. (Ecological homes, 2000 http://www.ecologicalhomes.com.au/energy_efficient_lighting.htm)

"There are three different housing types built within the village which take into consideration the geography of the land for access of sufficient sunlight and ventilation. In this way the use of energy for house cooling and lightning is significantly reduced."

Sarvodaya engineer

7.7.3 Strategies for water conservation

Fourteen rain water harvesting tanks were constructed in a cluster basis. Depletion of ground water and failure of monsoon rains are the main reasons for the water problems that exist in Kalutara. Rainwater harvesting simply means collecting the rain which falls on to roofs, then storing it in a tank until required for use. When required, the water is then pumped to the point of use, thus displacing what would otherwise be a demand for mains water (Rain water harvesting solution, <http://www.freerain.co.UK/>).

"Sarvodaya is the pioneer organisation in Sri Lanka introduced the construction of Ferro-cement rain water harvesting tanks. Which is most common in dry zone in the country. Although Kalutara getting sufficient amount of rain there is a period of water scarcity. The rain water harvesting was practiced by ancient Sri Lankans' and we introduced it back again because which is most effective way of water conservation. However rain water harvesting not a new concept to the world".

Sarvodaya staff member

"The reason for introducing rain water tanks on a cluster basis is lack of funding, Kalutara still getting sufficient amount of rain and there is no much troubles with water scarcity and most importantly as eco-village community they should be able to share their resources".

Sarvodaya staff member

The village has five drinking water wells to fulfill the drinking water requirements of the community. All drinking water wells have a water purification system to ensure that the community has access to safe drinking water. Drinking water wells are more useful for water conservation than the tap water system because they minimise the wastage of

water. Two bathing wells are used for washing and bathing which have been constructed in two corners of the village.

“Drinking and bathing wells are more common in Sri Lanka, the best thing is which help to reduce the water wastage compare to tap water. Because if people have tap water they are more prone to use it more than their actual requirement”

Sarvodaya staff member

The water purification system was explained as follows:

“A sub-terra system was introduced for waste water treatment. Black water coming from the toilets comes through the pipe lines to the sub-terra and it then gets filtered through different diameters of sand layers, and charcoal layers built underground. After purification the water is pumped to the surface and used for watering the plants in common areas. Water coming from the bathing well is direct to the pond after purification and grey water is also use for watering the plants which are tolerant to low quality of water.”

Sarvodaya engineer

7.7.4 Waste management

Infrastructure and resources for waste collection are lacking in most parts of Sri Lanka, hence uncontrolled scattering and dumping of garbage is widespread. There are no proper facilities for final disposal of most of the solid waste produced by households. Lack of resources makes it difficult for local authorities to do anything about the waste problem other than clean the main roads.

"The most difficult thing in waste management is motivate the people and development of pro-environmental behaviour. Because majority of them don't want to spend time for separation of the waste and for them it is very easy to throw it to the road side for collection of municipality. Although its challenging this eco-village is giving a good example for others."

Waste awareness programme leader

In Damniyamgama each household engages in compost-making from degradable solid waste. For collection of non degradable solid waste, separate bins are provided in two corners of the village. These bins are marked with paper, plastics, glass and metal and there is a group of people in the village who are responsible for proper management of waste within the community. The waste recycling agency comes and collects the waste when the bins are filled. In the initial stage of awareness it was difficult to implement the compost making and separation of garbage. Residents needed to become much more aware of the bad impact of unsustainable management of waste. Many of the residents admitted to throwing their waste on the beach or in the river or the road while living in coastal villages. They did not see another alternative; nor did they actively look for one. Before the establishment of the eco-village, none of the residents had attempted compost making, organic gardening or realised the benefits of sorting garbage. They learned the significance of these practices from Sarvodaya officials who worked in the transit camps after the tsunami.

"Sarvodaya has provided separate bins to each house for separation of waste. There is a committee appointed for look after waste recycling within the village. Every Friday one of the committee member informed to the villagers the time they have to take the collected waste to the main bins. When the main bins are get filled village sarvodaya society informed to the waste recycling agency and then agency come and pickup the

waste for recycling. Every household practice composting for recycling of degradable solid waste and those compost use for home gardening."

Community member

Several training programmes were conducted for the households about compost-making and now each household maintain its own compost bin. It is important to ensure effective degradation, because houses are situated closely together. Inefficient degradation produces bad smells and make it an unpleasant environment to live in. In order to ensure efficient degradation of solid waste, the use of effective micro-organisms was introduced to the village. Through a series of educational seminars and demonstrations, the community was made aware of the importance of waste separation, the reuse of organic material as compost, maintaining a clean and litter-free environment, the importance of home gardening with home-produced compost, the benefit of segregation and recycling of non-biodegradable wastes such as plastics, glass and metal. Education made a very substantial difference to the understanding, attitudes and practices of the people.

7.7.5 Energy conservation

Houses in Damniyangama are designed and placed for accessing sunlight and ventilation and each house uses solar panels for electricity. In the initial stage of development all the households requested to have the electricity from the national gridline, because according to their perception there are less troubles with this national grid system. Now, when comparing electricity bills they are much happier about using solar panels. Low cost motivates the people towards the use of renewable energy sources. Fluorescent lamps are use for lightning because they consume less electricity. These are the most energy efficient form of lighting for the households. Although more expensive to buy, they are much cheaper to run and can last up to ten thousand hours.

Such lights also produce less heat, helping keep homes cooler in the tropical climate of Sri Lanka.

"At the beginning I was not interested about solar panels, because I thought energy from solar panels is not enough for at least the lightning of the house. But now I realised that which produce enough energy not only for lightning but also for listen to the radio and watch the television as well. We use electricity from national grid when there is not enough electricity generation from solar panels, for example in rainy days. Also we don't want to too much worry about monthly bill and on the other hand we are giving helping hand to save the environment."

Community member

7.7.6 Recreational area

Within the village there is a children's park, a volleyball court and a small park for whole community gatherings. Such places are vital for exercises, play, recreation and the unity of the community in leisure activities. They are central to the harmonious atmosphere and development of the village.

7.7.7 Multi purpose community centre

Damniyamgama eco-village has a large eye-catching community centre which is the venue for Society meetings, seminars, short workshops, awareness and training programmes, meetings of sub-groups such as the youth group and mothers' group and society executive committee meetings. The centre, in addition to being an architecturally pleasing building, is designed for thermal comfort. It hosts the library, information technology centre, a cooperative bank and a pre-school. Programmes held here attract participation from a number of villages in the surrounding area. Recently a cultural centre was also established with dance and music lessons for young people

from Damniyamgama and ten other villages. This was considered necessary to improve cultural and aesthetic awareness and build a mentality that values peace and harmony- both with nature and with the rest of society.

"The community centre makes a wonderful location for larger group activities. It is the place for community gathering, holding the educational programmes and cultural activities. Also which is the most convenient place for social interaction. This brings in kids and adults from out side the community and has taking part of connecting us to the wider community. We have hosted several cultural activities on last few months, such as perahera festival, alms-giving, wesak lantan competition, traditional music and dance festival etc".

Village Sarvodaya society officer

7.7.8 Home gardening

Each household has its own home garden. This consists of tree species and vegetables to fulfill consumption needs. In the initial stage Sarvodaya gave all the necessary inputs to the residents to start their own garden. This was necessary in the beginning because the people did not have any interest in or experience of gardening. Yet soon they developed a real interest in growing and consuming the harvest of their own field. Now they are keen to talk about their garden, maintenance of the garden and the importance of it with others.

"In my previous house we haven't had any space for home gardening and actually I haven't any interest for doing it. But Sarvodaya not only developed our awareness for the home gardening but also provided initial input for that. So gradually I developed the interest for doing it and now its part of my daily routing."

Community member

7.8 Village management

Various sub-committees were established for the operation, maintenance and management of the different aspects of the village. Such organisation has been very important in capacity building and empowerment.

An environmental sub-committee is responsible for the landscaping, water and soil conservation and waste management. The aim of this committee is to establish and maintain standards to protect and enhance the environmental quality, visual beauty, and property investment value of the eco-village; promote maximum energy independence of the village; and process requests for specific architectural and/or environmental design changes throughout the village.

A multi-purpose centre committee oversees the uses of the centre, manages it, and makes sure that the building is always orderly, clean and inviting.

The objectives of the economic development committee are to facilitate the improvement of livelihood of the community members and to develop sustainable, micro-finance institutions at the community level, thus enabling villagers to meet their need for savings and credit services and to assist them in taking up a wide range of income generation activities. The committee links with the Sarvodaya Economic Empowerment Division (SEED) at headquarters and district level to implement training programmes and micro-finance schemes according to community interests and needs.

Overall responsibility for the functions and management of the village lies with an executive committee of the Sarvodaya society. This committee oversees the work of other sub-committees. It also deals with maintenance of inventories, preventive maintenance, repair, and security of buildings and equipment held centrally. It provides community waste pick-up, and promotes well-maintained residential exteriors. The executive committee is committed to improving residents' ongoing understanding and

knowledge related to eco-village goals and objectives, and to promoting positive relations with the wider world beyond the village. The committee organises activities such as tree planting and events such as village concerts.

“Main decision maker is the village sarvodaya shramadana society. When village need help from sarvodaya first they informed it to sarvodaya district office and then we interfere with it. If it is needed we informed to the head office as well. Generally Sarvodaya district office members attend for the monthly meeting of the village shramadana society, because which is the best place to exchange ideas and take decisions in consciousness way”.

Sarvodaya staff member

7.9 The society

As mentioned, the village has a local Sarvodaya society, affiliated to the national organisation. All the families within the village are members of the society and it is run by the executive committee described above. The aim of the society is community driven development and the society makes decision on what is needed. Officers of Sarvodaya act as facilitators and provide the necessary capacity building trainings that will improve the villagers’ ability to make decisions. The achievement of social sustainability is as crucial as economic sustainability. Social relationships play a vital role in managing common resources. All housing clusters are within walking distance of the village centre—approximately 500 meters, and active participation of residents in community decision making processes occurs irrespective of age and cultural background. The society as a whole, guided by its executive, ensures that such social processes happen. Issues such as land use, conflict resolution, business development, common property management and use of community resources are all openly debated leading to communal and democratic decision making. The society meets on a monthly

basis and more often if it needs to. All the village members participate. In the meetings they discuss progress of the village, training needs, operation and maintenance of the village, problems and constraints and also suggestions for overcoming challenges.

"There are some people in the village still not practice recycling. So in last community meeting we took the decision to keep them inform about negative impact of there behaviour and how its affect to others in the community. So in every Friday afternoon I personally visit to their houses and try to make them understand about recycling. There is a considerable progress in some families, but still we have to keep in touch with them."

Village Sarvodaya society officer

Community events and socialising regularly occur and are essential in promoting senses of common ownership and harmony. An example of such an event at Damniyangama is the New Year festival, traditionally held in April. In 2006 the village community got together and organised the festival with many traditional games. Children, youth and adults actively engaged in the activities and this helped to make a very strong relationship within the community. Another example is Wesak, which is the religious festival when people make wesak lanterns to celebrate the Lord Buddha's birth, enlightenment and passing away. A competition for wesak lantern making was held within the village. Then, on some full moon poya days, the community gets together and organises alms-giving and perahera festivals (Perahera is a Buddhist festival consisting of dances and richly-decorated elephants. There are fire-dances, Kandian dances and various other cultural dances). All of these occasions greatly improve the spiritual attitudes among the community.

The society organises these and other cultural festivals with the participation of the village community as well as people from neighbourhood villages. Cultural festivals entail traditional dance, dramas and songs they enable liaison between the eco-village and neighbouring villages. In this way, other village communities also get to know about concept of an eco-village, the importance of the concept, and methods that are being applied within the village to reduce negative environmental impact.

The local society also uses traditional song and dance to combat other problems such as delinquency, drug taking and chronic alcoholism. They have purchased musical instruments and engaged talented teachers to impart knowledge of classical local music and dancing to the village. This considerably improves the living environment (to hear traditional music emanating from the community centre) and their tastes. This activity has reduced alcoholism by providing an artistic outlet and a wholesome hobby for young men.

7.10 The eco-village as a basis for community-based environmental education

Various initiatives have already been described in this chapter which demonstrates the fundamental educational role of Damniyamgama. This role takes the form of both organised training and awareness programmes by Sarvodaya and also informal education acquired by residents' experiences of living in the village and being a part of its community and its development. Initial educational and awareness raising programmes focused on topics such as the impact of environmental degradation and the importance of environmental conservation. These common topics help to raise community awareness of the urgent need for environmental conservation and the role of an eco-village in this process. Activity-based awareness raising and educational programmes include the involvement of villagers in selection, planting and maintenance of green vegetation; community education and action relating to waste recycling,

composting and engaging in common farming practices. Ongoing educational and community participation programmes focus on home gardening and organic farming. Evidence of the educational success of such programmes is abundant. One community member, for example, said that when his family lived in the coastal belt they had no land and no idea about home gardening. Now resettled in the eco-village he is capable of maintaining his own garden and enjoys his life of planting and harvesting home grown vegetables.

Eco-villagers, with the help of Sarvodaya, understand that the future state of the world's environment depends not only on what we do today, but also on educating younger generations who are the caretakers of the environment of tomorrow. Hence there is a focus on youth education in the village. There is an attempt to change children's behavioural patterns and attitudes so they become to be more environmentally friendly citizens. In the eco-village members of the youth group take part in tree planting, maintenance of green areas and cultural activities. Several environmental education programmes are undertaken for village youth on topics including environmental conservation, degradation and organic farming. When undertaking one of the environmental programmes young people of the village came up with idea that establishment of a medicinal plant garden in the village common area was a good idea. They undertook collecting plant materials, and the establishment and maintenance of this medicinal plant garden.

"We can collect seedling from our neighbour village and also cow dung and other organic materials as well. To collect rare species we can ask help from Agriculture department or forest office."

Child programme participant

The village library contains environmental books. Young people and adults using the library are able to improve their knowledge not only about the environment but also other related aspects such as spiritual development. In December 2006 the youth group organised an art competition within the village with the theme of 'environmental conservation'. Students from all the schools in Kalutara district participated in this competition. Before the competition began, an awareness programme was conducted on topics such as the concept of eco-village, environmental conservation, waste recycling, using of renewable energy sources and water conservation. After the awareness programme, students were separated into different age groups, namely 6-10 years, 11-15 years and 15-18 years and created the drawings on different aspects of the environment. Such programmes are central to dissemination of information on the concepts of an eco-village and environmental conservation and to education for sustainability in more general terms.

After the competition an exhibition was held and that attracted other nature groups such as the Young Zoologists Association (YZA). This has since been transformed into a fully fledged ecology education course that is conducted in the village every Saturday afternoon. A lecturer from the YZA visits the village to educate youth and even interested adults on birds, animals, plants and reptiles that are an important facet of local ecology. The youth group in the eco-village also went to on a field visit to Sinharaja rain forest, this being one of the largest rain forests in Sri Lanka. A visit of this kind is crucial in improving knowledge about the natural environment and establishing appropriate attitudes toward conservation of the environment.

Even the youngest children in kindergarten in Damniyamgama undertake environmental education programmes. They engage in educational activities such as tree planting.

Beyond the village itself, Damniyamgama plays an all important role in environmental education on a wider scale. In other words, the educational function extends far beyond the village. Nearby neighbourhoods become involved in programmes. Also national and international visitors come to the village to learn about eco-concepts and to see how a good eco-village may function. Government officers and officers of other NGOs visit the project to gain knowledge about implementing the eco concept to a resettlement scheme. Damniyamgama has become a pilot project and something of an experimental ground which will inform the development of future similar settlements. For example one ongoing project is a partnership with the Asian Disaster Reduction and Respond Network (ADRRN) with the main aim of sharing experiences about building of sustainable resettlements for disaster affected communities. Through this project members from India, Malaysia and Japan come to the Sarvodaya eco-village to gain knowledge about the development of sustainable communities. Through these exposure visits they can share the experience with other members about improvement of eco-village concepts. They can consider changes that should be made because of specific country situations, examine implementation constraints and the impact of the eco-village concept on environmental conservation. Furthermore Sarvodaya undertakes an eco-village design programme once a year in collaboration with the Ecological Solution organisation. Students come from all over the world for the programme and every participant comes to the eco-village to get real life experience of what is meant by an eco-village. Without doubt, Damniyamgama may be regarded as a model village for demonstrating environmental sustainability and community-based development and education to other development agencies and donors.

"I have visited several tsunami resettlement schemes and there are lots of problems on those places. Such as social, environmental problems as well as problems with under-

developed infrastructure. Damniyamagama is best example for any other developer for construction of environmentally friendly housing scheme."

Damniyamagama visitor

7.11 Conclusion

The author of this thesis was central to an evaluation of Damniyamagama before engaging in additional work for this thesis, and so can comment from an informed position on what was found. This evaluation was conducted in 2007 (Disanayaka, 2007). A survey conducted among the residents of the village showed a very substantial increase in environmental awareness from pre-tsunami time to 2007. The residents were able to comment with satisfactory environmental knowledge on the benefits of waste management and sustainability concept of the village they are living in. It was established that the female members of the community are directly involved in waste segregation, using the recycling centre and maintaining the compost bin. Male members of the households are more interested in the home gardening and improving tree cover in common areas. The survey revealed that organic farming and composting have been taken up with enthusiasm. Respondents said that earlier, they did not grow vegetables in their gardens for a number of reasons. Now they are able to harvest pesticide free, home grown vegetables at low cost. They were able to explain the benefits of organic agriculture and using composted household waste as fertiliser. Earlier they were unaware of the harmful health effects of commercially grown vegetables which contain chemical residues of pesticides, fungicides and inorganic fertiliser. They could successfully describe the types of wastes that should go into the compost bin and what should be left out.

"Even kitchen waste, which we earlier threw in to the river, is now turned in to something useful. There are no flies and mosquitoes here. There is no smell of rotting garbage."

Village female resident

There is no question that the environment in Damniyamgama is far cleaner and healthier in comparison to the district's pre-tsunami residential areas. Many women commented that it is a good village to raise children in, because of cleanliness as well as the overall cooperative atmosphere. Men who participated in the survey felt that this village is better governed (due to the Society) than neighbouring tsunami relocation sites. Many interviewees said that they could not go back to living in an unclean environment now that they know the benefits of good environmental management.

"This environment is 100% cleaner than the area where we used to live."

Village householder

"Before the resettlement my family and I lived in a place near the sea and railway crossing. I did not have enough living space and children did not have a place to play. However, within the eco-village I have all these facilities and I'm very happy about the new house. Also I maintain my own home garden that I could not practice in my previous home. The home garden supplies the organic food for home consumption and when there is an excess we share it with our neighbours."

Community member

In conclusion, out of tsunami destruction and despair, a 'model' of good practice in eco-village development has been established by Sarvodaya. So far, it may be deemed a tremendous success-both from the point of view of the quality of life for the people who

inhabit it and also because of its highly successful role in the education of residents and observers about living in an environmentally friendly and sustainable fashion. It is an excellent example of community-based environmental education that impacts upon people of all ages within the village and policy makers beyond it.

Chapter 8

Case Study of Community-Based Environmental Education in the United Kingdom: Findhorn Eco-village in Scotland

8.1 Introduction

Findhorn eco-village is based at The Park, in Moray, Scotland near the village of Findhorn. The Findhorn community, which began in 1962 in northeast Scotland, is known internationally for its experiments with new models of holistic and sustainable living. It is also noted for its major contribution to education. Cooperation and co-creation with nature have lain at the heart of this community's work, ever since it became famous in the late sixties for its remarkable and beautiful gardens which survive in adverse conditions on the sand dunes of the Findhorn peninsula. The Findhorn eco-village is an example of the very best of current thinking on sustainable human settlements. The project's main aim is to demonstrate sustainable development in environmental, social, and economic terms. From the early 1980s onwards development of this eco-village began as an experiment to combine everything learned so far about the inter-connectedness of life and cooperation with nature. The village uses the best alternative and ecological technologies to help create a sustainable environment and culture. The village also plays an important educational role, as will be explained in this chapter. Numerous different ecological techniques are in use, and the project has won a variety of awards, including the United Nations best practice designation in 1998 (United Nations, <http://en.wikipedia.org/wiki/UN>). A recent independent study

concludes that the residents have the lowest ecological foot print of any community measured so far in the industrialised world.

(Findhorn eco-village, http://en.wikipedia.org/wiki/Findhorn_Ecovillage#_note-SDRC#_note-SDRC).

"We have done recently a whole exercise on foot print analysis. It took us one and half years to collect all the information. After analysis it was found that Findhorn has the lowest ecological foot print compared to other communities in the western world. Energy and food in Findhorn are localised and people try to eat seasonal foods. So energy and food make a substantial contribution to reduction of ecological foot print."

Community staff member

8.2 The Findhorn Foundation and Association

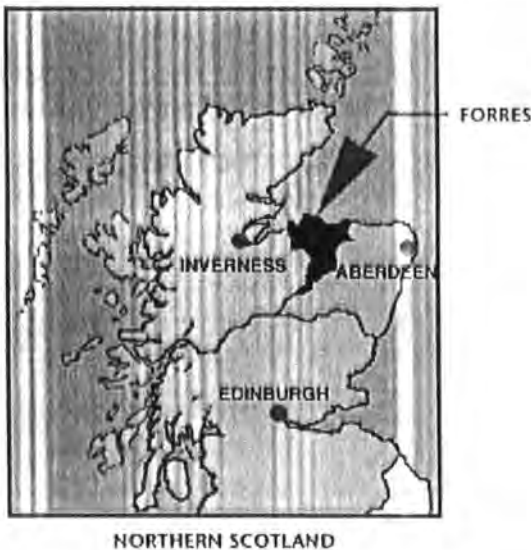


Figure 8.1: Location map of Findhorn

Findhorn eco-village is situated 25miles east of Inverness and 80miles west of Aberdeen in the northeast of Scotland. It is five miles from the town of Forres, as shown in figure 8.1.

It has been developed by the Findhorn Foundation which started as a caravan park in 1962. During the 1970s the Findhorn community grew from 20 to approximately 150 members and in 1972 the Findhorn Foundation was formed as an educational and environmental charitable trust to act as a focal point for the work of the community. The Findhorn Foundation and community explore new ways of living which express spiritual and holistic values in everyday life and help to create a positive and sustainable future. The community is an experiment, made up of various living and working clusters. These include wood and stone construction, whisky barrel houses, caravans, an education centre and the eco-village settlement. The village is home to individuals from all walks of life, including families, business people, interest groups, creative artists, charitable initiatives and healing professionals. The Findhorn Foundation has shown itself to be a leader in reintroducing a multifaceted spiritual world view which embraces elements such as 'nature spirits', Christianity and Buddhism, personal development, complementary health care, restoration of nature, eco-village design and artistic expression.

The foundation's pioneering work may be traced back to the 1950s. In 1957 Peter Caddy, Eileen Caddy and Dorothy Maclean were appointed to manage the Cluny hill hotel near Forres. In late 1962 they became unemployed and, for want of any other accommodation, settled in a caravan near the village of Findhorn. In early 1963 an annex was built so that Dorothy Maclean could live close to the Caddy family. They began organic gardening as a way of growing food. To this activity they brought their spiritual practices, which they believed led to communication with nature spirits. Such spirits helped their garden to flourish.

(Findhorn, wikipedia, <http://en.wikipedia.org/wiki/Findhorn>).

In the late 1960s the Findhorn community began to become famous for its work with the kingdom of nature. By the late 1970s the community had grown significantly and the emphasis of its work shifted from gardening to education. Hence it was decided to develop and maintain an 'ecological village'.

"In the late 1970s we had to think about how to develop the caravan park. This was not the most harmonious way to live. So we started to think towards the planetary village. Also, the Foundation really wanted to do educational work. So the Foundation made a short term budget for education programmes and training. Since then our main concern has remained educating the public."

Former chair of Findhorn Foundation

In the early 1970's, every member of the community was also a member of the Foundation. But about 20 years ago, people started to move to the area who wanted to join in community life but not to work for the Foundation. Hence emerged the 'wider community' from which came the motivation to build an eco-village and other community businesses and initiatives. In time, the wider community grew to the point that a new, overarching community association was needed and so the New Findhorn Association (NFA) was created. The Foundation is still the largest single organisation, owning most of the community's assets, and with about one-third of the members and roughly one-third of the economic turnover. The Foundation earns two-thirds of its income from educational programmes that attract over 4,000 people a year from around the world. The remainder of its income comes from a variety of associated businesses (including the college) and donations. Independent community businesses include organic food production, a community store, manufacture of solar hot water systems, Flower Essences, a Findhorn Press, a small retreat and workshop centre, wind power generation, and a biological sewage treatment plant. There are also several charities

working within the community on projects such as Trees for Life, helping orphans in Russia, and building health centres in Nepal. The community is based at two main locations. The first of these is the original site at the park, Findhorn, where there is a mixture of community and private housing, community and education facilities, and independent businesses and organisations. The other main site is at Cluny Hill in Forres where the Foundation owns a large victorian hotel. Other community businesses and organisations are scattered throughout the district, and many members live in their own houses in nearby towns and villages. Further details of the eco-community and its organisation and achievements follow later in this chapter.

The vision of the Findhorn Foundation is to be a centre of spiritual service in co-creation with nature, which encompasses education and community. It is a founder member of the Global Eco-village Network.

"GAIA foundation funded us to run the first eco-village conference. By the end of the conference we came up with the Global Eco-village Network (GEN) and developed the values that should be incorporated within the eco-village."

Former chair of the Findhorn Foundation

Its mission is to be an inspiring community, honouring and celebrating the interconnectedness of all life, whilst creating and supporting a peaceful and sustainable world.

Its objectives are:

- Delivering educational programmes which encourage personal growth, knowing that planetary transformation begins within each one of us.
- Creating innovative models for individuals and communities that seek to embody inspired forms of ecology, economy, culture and spirituality.

- Encouraging as many people as possible to experience the unique blend of spiritual community, educational centre and eco-village.
- Making sufficient annual surplus to be able to re-invest in Foundation work, mission and sustainability.
- Developing a vibrant, positive and interactive Findhorn Foundation inspired network world wide.

The New Findhorn Association (NFA) is the umbrella under which the various aspects of the community are co-ordinated. Membership of the association is open to all individuals and organisations and it has no religious, cultural or other boundaries. The only geographical boundary to the community is the requirement for New Findhorn Association members to live within a 50 mile radius of Findhorn. Yet there are exceptions even to this, such as the small sub-community on the Isle of Erraid on the west coast of Scotland. Today, the community consists of over 30 organisations and more than 400 people from over 20 nations.

The Association is managed on behalf of the membership by an elected voluntary council, but control of all aspects of the association's affairs ultimately lies with the membership through various democratic processes. The council's role is to facilitate communication across the community and empower grassroots members to provide services for themselves through a mixture of cooperation, private enterprise, sub-contracting, leasing and other means.

The Association's membership respects:

- an awareness of the presence of God in all aspects of our lives.
- relationships with each other and all people in the surrounding district that are marked by love, compassion, integrity, justice, tolerance and cooperation.
- living lightly on the Earth, in tune with natural rhythms and processes.

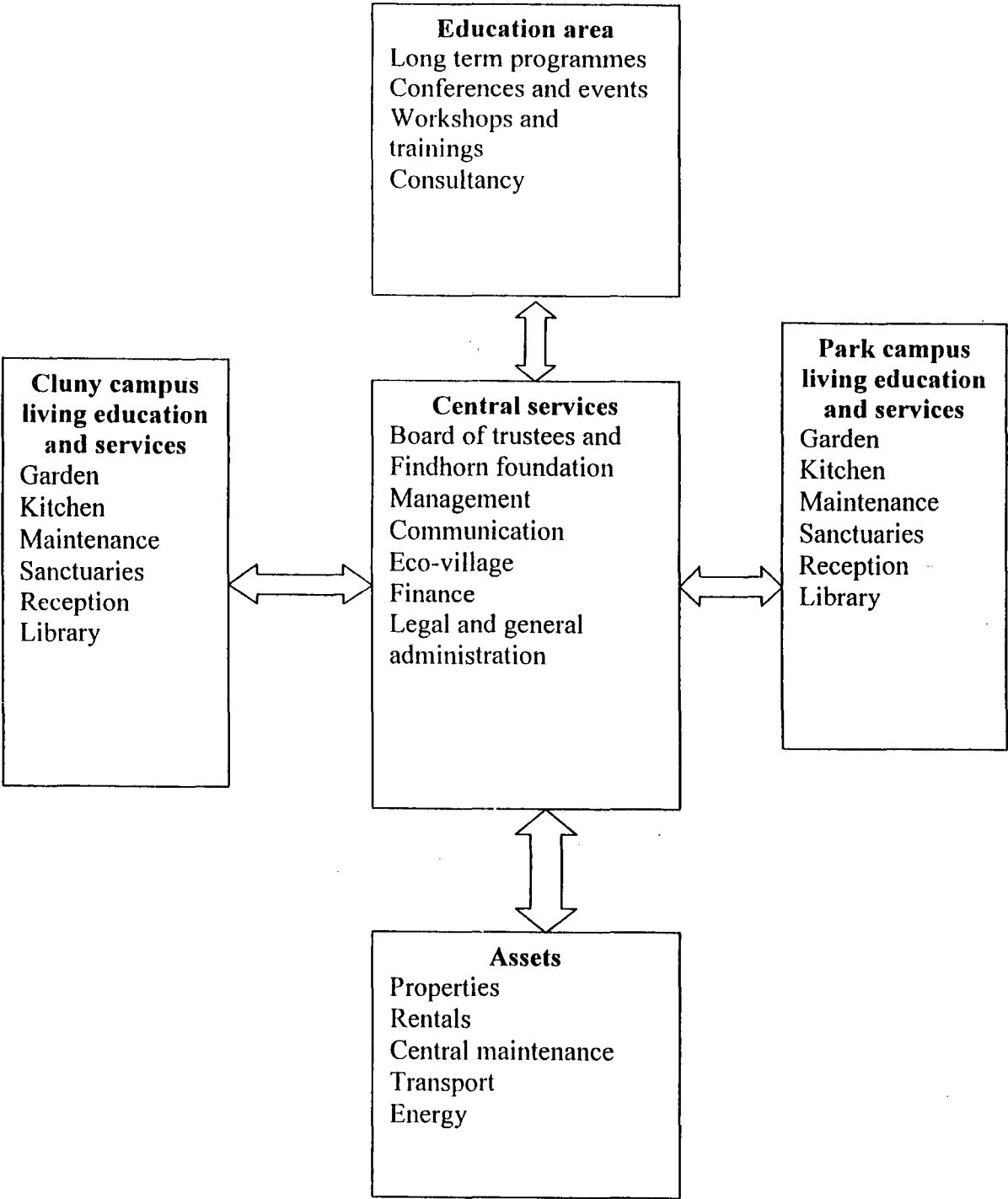
- enjoying a simple high-quality lifestyle, rich in human relationships and culture, rather than material goods.
- an economy based on the ideal of right livelihood.
- diversity of race, ethnicity, colour, religion, abilities, age, gender and sexual orientation.
- ecological, economic, social, cultural and spiritual sustainability.

The Findhorn Foundation aims to empower the Association to provide functions and services such as:

- Economic development assistance, e.g. cooperative buying and marketing, a shared office for association businesses, an advice service for small businesses.
- Coordinated planning and management of the land next to Findhorn bay on which many members live in order to provide better services to the growing community.
- A free conciliation service.
- Family, health, education and other social services.
- Coordination of arts and celebrations.
- Links with the local district, including cooperation in economic development, education, health, social services, the arts and other areas. (New Findhorn Association, 2007 <http://www.findhorn.com/>)

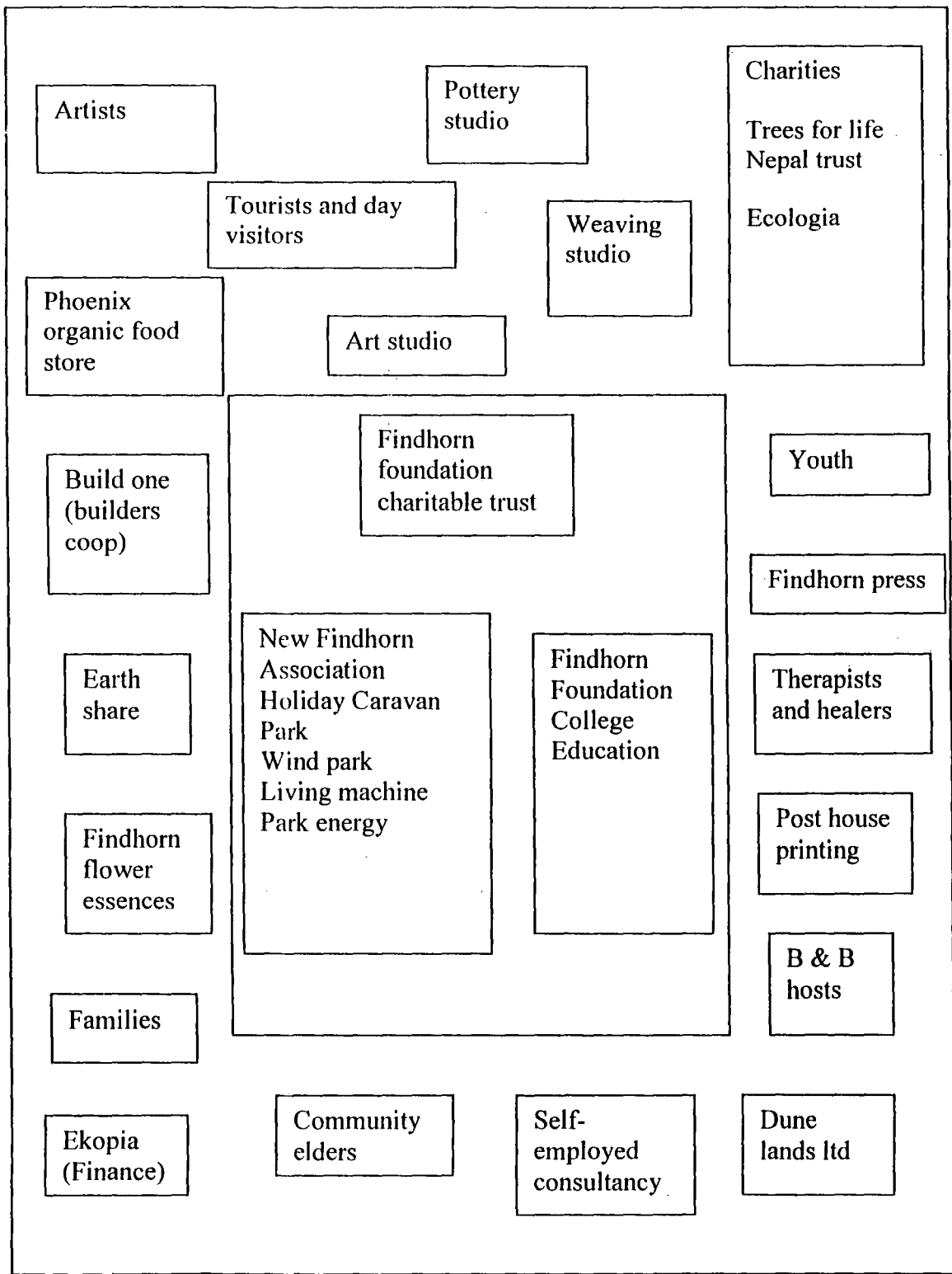
Figure 8.2 shows the organisational inter-relationships of the Foundation and figure 8.3 provides clarification of the various stakeholders of the community.

Figure 8.2 Organisational inter-relationship of Findhorn Foundation



(Findhorn Foundation, unpublished document)

Figure 8.3 Stakeholder map



(Findhorn Foundation, unpublished document)

Members of the Association live their lives according to statement of the common values of the community. This statement is called 'The Common Ground'. It is a living document, a code of conduct and something which serves as a tool for the transformation of people, the way members relate to each other, to the environment and to the world. Its wording is embraced by every individual:

- Spiritual practice

I commit myself to active spiritual practice and to align with spirit to work for the greatest good.

- Service

I commit myself to the service of others and to our planet, recognising that I must also serve myself in order to practice this effectively.

- Personal growth

I commit myself to the expansion of human consciousness, including my own, and I recognise and change any of my personal attitudes or behaviour patterns which do not serve this aim. I take full responsibility for the spiritual, environmental and human effects of all my activities.

- Personal integrity

I commit to maintain high standards of personal integrity, embodying congruence of thought, word and action.

- Respecting others

I commit wholeheartedly to respect other people (their differences, their views, their origins, backgrounds and issues), and the community's property, and all forms of life, holding these all to be sacred and aspects of the divine.

- Direct communication

I commit to using clear and honest communication with open-listening, heart-felt responses, loving acceptance and straightforwardness. In public and in private I will not speak in a way that maligns or demeans others. I will talk to people rather than about them. I may seek helpful advice, but will not seek to collude.

- Reflection

I recognise that anything I see outside myself - any criticisms, irritations or appreciations - may also be reflections of what is inside me. I commit to looking at these within myself before reflecting them to others.

- Responsibility

I take responsibility for my actions and for my mistakes. I am willing to listen to constructive criticism and to offer constructive feedback to others in a caring and appropriate fashion, to challenge and support each other to grow.

- Non-violence

I agree not to inflict my attitudes or desires on others. I agree to step in and stop, or at least say that I would like stopped, actions that I feel may be abusive to myself or others in the community.

- Perspective

I take responsibility to work through and put aside my personal issues for the benefit of the whole community. I will resolve all personal conflicts as soon as possible. I acknowledge that there may be wider perspectives than my own and deeper issues than those that may immediately concern me.

- Co-operation

I recognise that this is a spiritual community and that it functions only through my co-operation and my good communication. I agree to communicate my decisions clearly. I agree to communicate with others who may be affected by my actions and decisions and to consider their views carefully and respectfully. I recognise that others may make decisions which affect me and I agree to respect the care, integrity and wisdom that they have put into their decision-making process.

- Resolution

I commit to make every effort to resolve disputes. At any time in a dispute I may call for an advocate, friend, independent observer or mediator to be involved.

- Agreements

I commit to keeping agreements I have made and not to break or try to evade any laws, rules, or guidelines; to have honest dealings with all bodies.

- Commitment

I commit to exercising the spirit of this statement of 'Common Ground' in all my dealings. (New Findhorn Association, <http://www.findhorn.com/nfa/NFA/CoreValues>)

8.3 The community: structures and decision making

The community's structure is in the process of change with the evolution of two initial categories of people in the community. The first of these categories is of Foundation students or staff. These people are essentially working full time for the Foundation and are fed and housed in Foundation accommodation. The other category is of open community members who decide on their own level of involvement or work with the Foundation and its community life. They are responsible for their own housing and finance. In recent years, such segregation is becoming less clear.

The growth of the open community and relative reduction in size of the charitable Foundation has led to some confusion as to what are 'community' decisions, what are 'Foundation' decisions, and who is or is not included in decision making. What is evolving is a structure of inclusion that is a synthesis of both categories called the 'selectorate' and which is made up of people that have been in the community a minimum length of time and completed some minimum education or integration process.

Formal responsibility for Foundation management and decision making lies with its Trustees and a Management Committee. All ten Trustees have a long standing connection within the Foundation, most having lived there for several years. The Management Committee, which takes care of the day today administration of the Foundation, consists of 6-8 people. These individuals, chosen by the selectorate, are charged with maintaining the community's social and spiritual health. In particular, their role is:

- To co-ordinate discussion of business that concerns more than one aspect of the Foundation.
- To make decisions for the whole in conjunction with the relevant managers of the different aspects.
- To perform certain duties on behalf of the Trustees.

Major decisions are made in large community meetings using a consensus model. Within the community residents learned how to listen to each other and how not to reject each other. Generally, decisions big or small are made through 'attunement' or a combination of inner sensing of the 'right' thing to do combined with intuition and common sense. Whether this is always achieved can be hard to determine and often

there are complaints that making a decision about anything is a major process. Yet the general view is that correct decisions are usually made.

"When the Foundation or a group of people want to make new development, there are several community meetings for talking about it and getting opinions, coming up with new plans and again getting opinions from the community. Although there is always a group of people responsible for making decisions, we always get much feed back from the community before taking the final decision."

Community staff member

Decisions on who will be able to live at Findhorn are taken by the Management Committee. Aspiring members fill in an application form which details all terms and conditions. Such conditions refer to such matters as waste recycling, water and energy conservation and other eco-friendly lifestyles.

"In the application form there is a guide line about how to live in the eco-village, what are the things they should be followed within the village, how to live harmoniously with each other and environment etc, and by signing the application from they all agree to follow those social norms. Every resident who wants to live in the eco-village should follow the experience week training course to have a better idea about the eco-village living."

Foundation manager

Applications are evaluated and if necessary interviews are held. People who are successful must agree to engage in an initial training week. New staff members have to undertake a whole month training programme in order to get a better understanding about living and working within the community.

8.4 Living in Findhorn eco-village

As mentioned earlier in this chapter, the Findhorn eco-village model presents itself as an inspiring and viable solution to eradication of poverty and degradation of the environment, while combining a supportive social-cultural environment with a low-impact lifestyle. It is a constantly evolving model providing solutions to human and social needs while at the same time working in partnership with the environment to offer an enhanced quality of life for all.

The author's observations within the village identified the following characteristics that are summarised below and then elaborated upon.

Within the village a high priority is placed upon:

- Ecological building
- Renewable energy systems
- Local organic food production
- Sustainable economics
- Social and family support schemes.

To achieve these priorities, various environmentally friendly features are incorporated.

These include:

- The use of passive solar features where possible through orientation and window layout.
- Solar panels for domestic hot water heating
- A district heating system using a gas condensing boiler for highest fuel efficiency.
- Low energy light bulbs throughout.
- Cellulose insulation made from recycled paper.

- Non-toxic organic paints and wood preservatives throughout.
- Locally grown and harvested timber from managed forests.
- Roofing with natural clay tiles.
- Collection of rain water for garden use.
- Shared facilities (laundry, kitchens) in order to avoid unnecessary duplication.

Findhorn residents have more communal residential arrangements than people in conventional communities. This permits a significant sharing of energy with numerous eco-village buildings designed around the heating system. This system is based on the use of recycled woodchips as fuel, which heats the entire residential area. Housing is designed along highly energy efficient principles, thus further reducing electricity use. A co-house contains a full kitchen, shared bathrooms and a common living room. Such arrangements support human interactions and also help to reduce the use of energy for lightning and heating

The private houses within the village are individually designed, but all of the buildings are required to pass through the community planning process and adhere to ecological and energy efficiency standards. Designers are encouraged to try new and innovative ecological techniques, resulting in a range of houses that experiment with different combinations of ecological features, suited to both the site and the lifestyle of the owner. Ecological features which are common to all the homes are high insulation levels, large passive solar south facing windows, and fewer and smaller north facing windows. Thus solar gain is maximised and heat loss minimised. The guidelines for new buildings in the eco-village encourage very high levels of insulation, and double or triple-glazed windows with low-emission window coatings. Energy efficient compact fluorescent light bulbs are installed in many residences, businesses and community

buildings. Energy running costs for newer houses are many times less than the running costs for the original old caravans that were first in use as residences on the site.

"When people wish to build a house within the village, the Foundation asks for ecological features. Things such as compost making should be included. All materials should come from suppliers who follow ethical and environmentally friendly practices, using local raw materials and using non-toxic materials etc. When the Foundation is satisfied with the building plan it will be approved for the construction. Every building plan should undergo Foundation investigation before beginning the construction."

Foundation manager

Managers were keen to explain more about renewable energy sources.

"The community as a whole owns four wind turbines, which have a total capacity of 750 Kilowatt. These supply the totality of the community's electricity needs with surplus. The community owns its own private electricity grid and electricity produced by the turbines is sent to a substation that meters the flows, alters the transmission voltages and acts as a switching station. If production exceeds demand the surplus is exported to the grid. If the wind does not blow sufficiently then the site imports from the grid. Overall the village is a net exporter of electricity. Green electricity generation is one of the very successful community business within the village."

Foundation manager

"Although electricity comes from the national grid line, people are more prefer to have wind generated electricity. Because community members are more aware about renewable energy sources and their positive impact for the environment."

Community member

The village community centre consists of a kitchen, a dinning room, a lounge and a space for meetings and social occasions for residents and guests of the Findhorn Foundation. An important aspect of life is socialising whilst preparing food. Guests can share communal experiences and interact with residents. It is a wonderful place for community member themselves to socialise.

The village also has a large universal hall which serves as a theatre and concert hall. This was built between the years 1974 and 1984. It is a five sided auditorium, and is one of the best entertainment facilities in north east Scotland. It hosts many conferences and workshops, international theatre, music and dance. Examples of events held include dramatic performances by the national theatre of Scotland, range of comedy, contemporary music, evenings with the Scottish chamber orchestra, films and children's entertainment. These different events encourage community interaction and so the hall is a very important gathering place for all residents.

Turning to the subject of local organic food production, the original garden named Cullerne was bought by the Foundation in 1978. Initially the 7 acres of land included vegetable fields, flowers, herbs, fruits, woodland and a one acre plot covered in poly tunnels. As the years have gone by, the garden area has expanded from 7 to 15 acres, spread over three sites. In 1994 a community-supported agriculture scheme called Earth Share, based on organic and biodynamic farming methods, was established to increase the use of local produce as well as to enhance the quality of food. Only organic methods are used to grow up to 30 different vegetables throughout the year. Currently the land provides more than 70% of the community's fresh food requirements and supplies 200 individual households.

Whilst Earth Share provides the fruit and vegetable needs of the community, organic milk, cheeses, eggs and meat are produced by Wester Lawrenceton farm which covers a

95 acre site overlooking Findhorn bay and the Moray Firth. With cows, sheep, chickens and dairy facilities, the farm is providing solutions to reducing food miles, whilst also combining the best of traditional methods with 21st century technology. Villagers try to 'eat with the season' thus reducing food miles and also connecting with traditional seasonal foods. Most of the food is organic and vegetarian, contributing to a further lowering of the food footprint. The organic garden receives many Foundation guests who can come and work with nature. It is also a venue for harvest festivals and other community celebrations.

"Here I'm contributing my time for organic farming. This was one of my wonderful experiences in my stay at Findhorn."

Community volunteer

This community engages in what might be described as 'community-supported agriculture'. This is a relatively new socio-economic model of food production, whereby production, sales and distribution are aimed at increasing both the quality of food and the quality of care given to the land, plants and animals. High quality foods are produced using ecological, organic or biodynamic farming methods. Community-supported agriculture substantially reduces potential food losses and financial risks for the producers. It operates on a system of weekly delivery or pick-up of vegetables; sometimes also flowers, fruits, herbs and even milk or meat products in some cases. Thus, individuals, families or groups do not pay for x pounds or kilograms of produce, but rather support the budget of the whole farm and receive weekly what is seasonally ripe. The cost of a share is usually competitively priced when compared to the same amount of vegetables conventionally grown, partly because the cost of distribution is lowered. Clearly all products are very fresh and the negative effects of long-distance transportation are eliminated.

"There is a high demand for foods produced both from the eco-village itself and also from its agricultural land. People pay a fixed amount of money and they receive baskets of fresh fruits and vegetables in each harvest. Volunteers help with cultivation, harvesting and packaging. After packaging, foods are delivered to the correct destinations which are close to the farm."

Community member

Turning to the subjects of waste water, sewage and waste management, the village developed a phased plan for responsible water management. In 1995 a waste water treatment facility was built called 'the living machine'. This uses natural non-chemical biological systems to clean sewage and creates a mini-ecosystem within a greenhouse environment. Grey water and sewage run through a series of tanks containing plant species and bacteria that break down the sewage in a process similar to decomposition in the natural world. Diverse communities of bacteria, algae, micro-organisms, numerous species of plants and trees, snails, fish and other living creatures interact as whole ecologies in tanks and bio-filters. It has capacity to treat up to 65 cubic meters of waste water per day and treat sewage from the population of up to 300 people living at the Findhorn Foundation and is providing a research and educational facility to promote this technology throughout Europe.

"We are not using treated water for any particular purpose. Treated water is directed to the forest by pipe line and there it is released into the environment as pure as it was when it came to our home."

Foundation staff member

In order to recycle domestic waste in an ecologically friendly manner, the village has separate bins to collect glass, paper, plastic and cloths. When the bins are filled the Findhorn Association informs the local authority which then undertakes waste collection and recycling. Households make compost from degradable solid waste and use this in their home gardening.

"Waste recycling is undertaken by the New Findhorn Association (NFA) in collaboration with the municipality. When the bins are filled NFA calls the municipality and then they will come and collect waste for recycling."

"Waste recycling has become a part of the community life and every individual takes the responsibility for that."

Community members

A final aspect of living in Findhorn village is that of co-operative social economics. Local Exchange Trading Systems or Schemes (LETS) are local community-based mutual aid networks in which people exchange all kinds of goods and services with one another, without the need for printed currency. Members of the Findhorn community along with people in the local area participate in two local LETS schemes, namely Findhorn and Kinloss LETS and New Moray LETS, the latter currently being the most active LETS scheme in Scotland. For example, a member may earn credit by doing childcare for one person and spend it later on carpentry with another person in the same network.

In 2002 Findhorn eco-village floated the Eko currency scheme, a local system of exchange. Ekos are valued at par with sterling, 1 eko = £1, and notes are in one, five, ten and twenty denominations. The principal function of the currency scheme is to

promote local trading and to strengthen the local economy. Guests visiting the community can purchase the notes and use them.

In Findhorn there is roughly £20,000 of notes in circulation and issuing them has enabled the making of low interest loans and donations to support various initiatives including an ecological guest facility, the wind park and the local youth project.

"The main purposes of the scheme are to encourage trading with and between community businesses, reduce banking and interest charges, and provide community projects with access to low interest capital. Since local currencies are only accepted within the community, their usage encourages the purchase of locally-produced and locally-available goods and services."

LETS initiative Director

Thus, for any given level of economic activity, more of the benefit accrues to the local community and less drains out to other parts of the country or the world. For instance, construction work undertaken with local currencies employs local labour and utilises as far as possible local materials.

When any business comes to the stage that it can be managed by itself, the Foundation allows it to run independently.

"Many departments which used to belong to the Findhorn Foundation became independent after they became strong enough to run independently. There are several independent businesses running within the village, which include Earth Share, Findhorn Flower Essences, self employed consultants, Dune Land limited, Findhorn Press, a bakery, a cafe, a pottery, and a weaving and art studio. Trees for Life is an one of the award winning conservation charities dedicated to the regeneration and

restoration of the Caledonian forest in the highlands of Scotland and is part of the Findhorn community."

Former chair of the Findhorn Foundation

Independent businesses pay taxes to the Foundation which help finance the operation and also pay for the maintenance of the common properties such as roads, community centres and the library.

8.5 The educational role of Findhorn eco-village

Findhorn plays a major role in community-based environmental education and education for sustainability. Its educational impact extends across the community itself and beyond to the wider world. In the initial stage of development there were various awareness programmes for the community within the village. Nowadays there are fewer of these because people coming into the community tend to be very aware of sustainability and sustainable living and as mentioned, it is a requirement to take part in the one week induction programme. That said, simply by living in the village and adhering to its ways of life and principles, all residents are continually learning about their relationship with nature.

"There are no exact training programmes for the community itself. In the past it was a part of the educational programme to teach the community about waste recycling, compost making and organic farming. But now when you become a guest you will learn all the things by doing, as they are part of the system. People come in with a fairly high level of awareness and commitment and also there are various community meetings and lots of literature about the Foundation. Anyone can read this literature and can learn about eco-village living. People support each other. If someone is not doing recycling, a

group of people who are responsible for that area will go and talk with them and build up their attitudes towards appropriate recycling of waste."

Foundation staff member

On the subject of low participation rates in educational programmes, it was explained that:

"The main reason is high programme cost. If the person is a staff member of the Foundation he/she can attend some of the training programmes free of charge. If the person is a member of the Foundation he/she may have a discount. But if the person is only a community member then he/she has to bear the full programme cost. On the other hand if the person is full time employee then they will not have time to participate to the programmes."

Foundation staff member

A particular emphasis is placed on educating the community's youth. The Foundation believes that positive changes in the world can happen by nurturing and protecting children and nature. Various youth projects aim to promote an ecological approach to life, the protection of the natural environment through education, and opportunities to broaden young people's minds through cultural exchange. To achieve these objectives, the Foundation organises training for the young of the village on such topics as environmental conservation, waste recycling, water conservation and spiritual practices.

"We are running some holiday programmes for the young people in the village. These include guest talks about environmental conservation. Furthermore in Findhorn School students are taught about the natural world and how to be a part of the natural world in a gentle way."

Foundation lecturer

Local young people may also attend the Findhorn Foundation School which does not follow the Government's National Curriculum for schools in the UK. The curriculum here places emphasis on environmental education, farming and spiritual practices. Students actively engage with compost making, farming and environmental conservation practices. Teachers and parents believe that such practical engagement with nature is important for personal development as well as education.

Moving beyond the villagers themselves, Findhorn eco-village implements collaborative projects with various local authorities. Such collaborations began in 2006 and include the laying on of sustainable education programmes for members of local authorities, policy makers and school children.

"We started to work with one specific agency called United Nations Institute for Training and Research (UNITAR). After 6 years of work with them the Foundation realised that Findhorn had the ability to become a training institute for Northern Europe on behalf of the United Nations. Since last September we have been part of a network of 12 training centres for the UN. We teach local institutes how to integrate sustainable development in their policies and practices."

Foundation manager

By way of an example of local collaboration, the Moray Council published an environmental strategy document, which sets out a range of measures to raise awareness of the need to reduce the ecological footprint in the local area. The Findhorn Foundation worked alongside the Council in the design and production of this document. The aims contained within it are those of:

- Encouraging more people to make use of community recycling facilities.
- Promoting more cycling and walking opportunities and improving access to public transport.
- Encouraging agencies and community groups to work together to ensure good air quality and improve the environment.
- Supporting joint projects to conserve and enhance natural habitats, important species and areas of landscape value.
- Encouraging the use of renewable energy in housing.

This is an example of a true community educational partnership inspired by the eco-village.

Moving beyond the local area to national education impact, Findhorn has risen to the exciting challenge of working with young people from the heart of inner-city London. In early June 2006 the Foundation and community were host to 24 boys aged 12 to 15 years from Rokeby, a multicultural, multifaith inner city school in east London. The school was on the verge of being closed down three years previously but students and staff worked extraordinarily hard to turn it around. A new building is planned for 2009/2010 and the boys were clear that they wanted their new school to be eco-friendly, to have a strong place in the local community and to be based on a new policy of respect that they had created. Their week at Findhorn was spent engaged in educational sessions which included learning non-violent communication techniques, how eco-technologies work, visiting a local school, sharing with each other in circle time, eating and socialising with the community and working in the Foundation's maintenance and garden teams. The week's programme was deemed to be a great success.

Going yet further a field, the Foundation engages with education at global level. It is associated with the United Nations Department of Public Information, specifically in the areas of education, sustainability and values.

As long ago as the October 1982 Conference 'Building a Planetary Village' hosted by the Findhorn Foundation, its impact was recognised. Findhorn was gaining an international reputation as a place demonstrating that a human settlement can be sustainable in environmental, social, and economic terms.

In 1995 the first international conference on 'Eco-villages and Sustainable Communities for the 21st Century' was held in Findhorn. The Foundation has actively engaged with the United Nations Institute for Training and Research to bring an expanded curriculum of education for sustainable human settlements both to courses at Findhorn and through the global eco-village network. In partnership with other educators within the global eco-village network, the Foundation is now helping to develop a global curriculum, drawing together education initiatives, knowledge and skills to support a worldwide transition towards sustainability

Now, in the first decade of the 21st Century, the Findhorn Foundation is a major centre of holistic education, conducting programmes for over 4,500 residential visitors a year from over 50 countries. It is the heart of what has become one of largest holistic communities in the world and is the centre of this rapidly developing eco-village movement. Students come from all around the globe to have an in-depth experience of the quality of life to be had in small-scale, self-governing communities that are seeking to provide for more of their own needs. There is a wide variety of courses and conferences on offer and this remains the Findhorn Foundation's core activity. Education at the Foundation has been described as that process which leads a person

into a greater understanding and realisation of the truth that lies within them and the world around them.

"Education in the Findhorn Foundation and community is a transformative process resulting in lives that are changed and which can change the world. It is education for life, a self discovery which brings each person closer to knowing his or her own essential divinity and context in the world."

Findhorn staff member

As part of its commitment to global change the Foundation provides bursaries for those from developing countries or who are unemployed or have low incomes.

At the heart of its educational endeavours at the level of higher education is the Findhorn Foundation College. The role of this institution is to develop holistic accredited courses in higher education, vocational training and professional development that draw upon the 45 year experience of the Findhorn community in all aspects of sustainability living, the arts, and education for personal and spiritual development. The educational philosophy of the Findhorn Foundation College is based on the deep realisation that humans are part of a living system that is shaped by a set of strict ecological principles and finite constraints.

Examples of educational programmes conducted within the village for its many visitors include experience weeks for people of all ages, exploring community life, sacred dance, spiritual practices, primal painting, gardening, working with nature, the game of transformation, the dance of life, women revealed, leadership edges, learning English in a community, the art of leadership, embracing diversity and training in conflict facilitation.

Taking part in one of the 'experience weeks' is regarded as being the most effective way of engaging with the community. During such weeks, visitors focus on what an eco-village is and how to turn communities into sustainable human settlements, prioritising local and organic production, renewable energy, cooperative social economics, inclusive decision-making process, cultural and spiritual diversity, integrated holistic health care and global networking.

"It is an experience that one has never experienced before. It is a time to find out about the community, working in different kinds of departments, also sharing as a group and in meditation. For me it is an amazing thing to do."

Community 'experience' volunteer

A similar 'Youth experience week' is run for young people aged 14 to 18 years. Topics cover issues affecting the environment, community living and discovering individual power, so that they are able to steer their own futures. Other topics for study by young people include how to turn communities into sustainable human settlements by prioritising local food production, renewable energy, ecological building, cooperative social economics, inclusive decision-making process, cultural and spiritual diversity, integrated health care and global networking.

The eco-village training programmes in general provide a practical forum for learning and for developing action plans for urban and rural settings in both developing and developed countries. The training promotes the transference of tools and techniques for creating sustainable communities.

Specific examples of educational modules and courses include:

- **Eco-villages: new frontiers for sustainability**

This module intends to give an overview of the eco-village model within the context of a planetary movement towards sustainable human settlements. Students look at the 10 years' history of the eco-village movement and how the so called 'habitat revolution' is unfolding. They explore how eco-villagers move toward sustainability by looking at local organic food production, ecological building, renewable energy systems, cooperative, social economies, inclusive decision-making processes, cultural and spiritual diversity, integrated holistic health care, global networking, holistic and 'whole person' education.

- **Building effective groups:**

This module is designed to develop the skills needed to work effectively with both large and small groups. Participants learn how to turn a challenge into a great opportunity, by harvesting the creative potential inherent in this diversity. They are introduced to a wide variety of easy-to-learn and simple-to-use methods, and share tools designed to bring renewed inspiration and a sense of achievement to group work. They also explore issues of leadership, power and governance in communities and eco-villages.

- **Permaculture:**

This module introduces the principles of permaculture for the conscious design of a sustainable future, based on co-operation with nature, caring for an earth and its people. Permaculture draws together knowledge and skills from many ecological disciplines to meet basic needs of food and shelter, as well as creating sustainable social and financial structures.

- **Earth Share: food, farming and community.**

This module explores community relationship to food and farming and different ways of relating to food and the land, in the context of a community-supported agricultural scheme. Participants visit and work on the various farming and gardening projects and cook a meal together for the community from ingredients which they have harvested.

- **Designing sustainable human settlements**

Students following this module learn how to build ecologically as well as beautifully, how to maximise energy efficiency while creating the healthiest possible indoor environment. Topics include the use of low cost indigenous construction techniques as well as conventional construction; simple ways of using nature's renewable energy sources; recycling and managing wastes; water cycles and 'living machines' based on natural systems; community design and site planning; and the maintenance and upgrading of existing infrastructure.

- **Right livelihood**

Participants of this module consider cooperative ownership, global justice and sustainability, complementary currencies, voluntary simplicity, stakeholder business enterprises, fair trading, ecological foot printing, and social auditing. They investigate methods of raising funds for social and community projects and develop an understanding of how to create a project brief and business plan.

- **Deep ecology, wilderness and ecological restoration**

In this module, students look at deep ecology, the importance of wilderness for the planet and humanity, and the role of people in helping to heal the earth's degraded ecosystems. Based on the principles of Findhorn's work with spirit in nature, participants go out into the Scottish highlands, and take part in the 'Trees for Life' project which is helping to restore the Caledonian forest area.

- Art for the healing of our world

This module helps people understand how to integrate art, land and eco-village life. They look at how eco-villages create a culture of ethics, aesthetics and beauty and try to achieve freedom from materialism and mass production. They look at the role of the artist in reinvigorating and healing local communities, and art as a liberating force for collective transformation and self realisation.

In the specific of healing through art, students learn about the awareness and skills necessary for the arts to be energising, life-enhancing and healing. Artistic expression through drawing and painting is assisted by reflection and reading. Participants can build up substantial confidence, knowledge and experience in using healing through art as a tool.

- Education for sustainable development:

This is an accredited semester for students at a United States University, which may be counted towards their degree programmes. The course aims to give a greater understanding of the systemic nature of the threats to the planet's well-being and the social, ecological, economic and cultural consequences of many people's current lifestyle and community development practices. It examines the relationship of humans with the natural world. The programme is designed to facilitate a transition to a sustainable culture and the main topics covered are applied sustainability, eco-village living at Findhorn, exploring sustainable living through creative expression, and the theory and practice of group dynamics and conflict facilitation.

"Students come from the different universities and they usually have a general interest in sustainable living, but majors vary, including: political science, English, biology, environmental studies, sustainable development etc. However we keep our programme small so that the community aspects of the programme can be best fostered. Therefore

most of our programmes tend to have between 12-16 students. Programmes are tailored for students to experience the culture of the eco-village and many seminars and lectures are offered by local experts and professionals”.

Lecturer, Findhorn student training programmes

Students are living and learning in the community and their curriculum includes instruction on fostering sustainability in individuals as well as at collective levels, gaining valuable field experience in areas including sustainable food systems, ecosystem restoration and group facilitation skills.

8.6 Conclusion

In conclusion, it may be said that the main and greatest strength of Findhorn is the collective spiritual orientation that allows a greater perspective and understanding to be brought into the inevitable challenges and conflicts that arise in community life. The size of the community now is also a great strength in providing a wide diversity of people and activities. Another important ‘glue’ is the joy of living in a community of like-minded people, with its vibrant social and cultural life, and its frequent rituals and celebrations.

Interviewees were pleased to share their thinking on what motivated them to live in the eco-village. For some, the main reason for being there is to join a community of creative and expressive artists. For others, it is the desire to live ‘more lightly’ on the earth, exploring sustainable living through being part of the eco-village. For yet others, it is a place of healing both through participation in life in the village and through the many alternative therapies available. Also, for many it is a place of transformation where they find themselves caught up in a process of deep personal change. Many people describe the fact that they read about Findhorn before they came and wanted to find out more.

On arrival they became motivated to stay in the place and enjoy its vision, community lifestyle and pro-environmental behaviours.

"I heard about the Findhorn Foundation from a garden book and I found it a very inspiring. So I decided to visit Findhorn to find out more. Now it has become my hōme."

Foundation manager

"First I visited Findhorn for an experience week with my parents and after finishing the programme I went back to my country. But I have realised that Findhorn is the best place for me to live. So I came back and worked as a volunteer for the Foundation for few years and finally decided to build my own house in the village because I wanted to be part of a real community."

Community member

"I came here as a participant on an eco-village training course because at that time I was very interested in learning about sustainable living. After finishing the training course I decided to stay here and eventually I developed my career as a lecturer in the Findhorn Foundation, teaching sustainability development for visitors."

Foundation staff member

Perhaps the greatest challenge to the community of Findhorn is maintaining its close and connected community spirit that is such a critical part of life at Findhorn as the community grows and continues to diversify. Providing an economically sustainable lifestyle for the Foundation's staff is also of great importance and is something the Foundation is actively working on.

Having identified such strengths and challenges, another key conclusion to be drawn from investigating the success of Findhorn eco-village is that it is engaging in a truly outstanding role as a provider of community-based environmental education. The

'lived' experience of this village impacts without doubt on the environmental understanding, awareness and behaviours of each of its residents, its casual visitors and participants in its numerous formal courses and programmes. Furthermore it influences educational policy and practice at local, national and international levels. It educates in, about and for the environment in general and in, about and for the role of eco-villages in sustainable development.

Chapter 9

Discussion, Conclusion and Recommendations

9.1 Overview of chapter

This study of the eco-villages of Damniyamgama and Findhorn has revealed without doubt that both have aspirations to be model villages for the demonstration of sustainable living and also to be centres of excellence for education. Both communities are successful in these aspirations. Both are demonstrating an excellent range of sustainable living and development practices and both are achieving a great deal in terms of community-based education that is effective both within the community itself and beyond it.

The study also reveals some significant differences in the practices, outcomes and effectiveness of the villages' endeavours. Furthermore, it has given rise to findings which reinforce and are relevant to a number of the theoretical research areas and previous research findings that have been presented in Chapter 3. So the discussion in this chapter and conclusions drawn focus on the eco-villages' similarities, differences, relevance to the research literature, and on recommendations for future development and research.

9.2 Initiation of the villages: commonalities and differences

Damniyamgama eco-village was designed as a model village for tsunami affected families in order to demonstrate the construction of sustainable resettlement schemes for disaster affected communities. The village is now at the forth stage of Sarvodaya development process as discussed in Chapter 7. It was established as a pilot project, and given the lack of background experience, there are many areas for further development. The main priority of Damniyamgama was to educate and improve the living standard of

the community living within the village before implementing large scale educational programmes. Yet despite this initial aim, it has been found that the Sri Lanka village does have significant influence in educating local, national and international communities.

A key reason for the initiation of Findhorn was the personal interest of a small group of people in establishing such a community. It gradually passed through different stages of development according to these people's interest in developing a new kind of community-oriented and ecologically based neighbourhood. It rapidly gained momentum as a centre of excellence as an educational institution with a focus on sustainable development, Findhorn eco-village is now in a position to attract participants from all around the globe, because of its extensive reputation for its educational programmes.

In Damniyamgama the word 'community' mainly represents people who live in the eco-village. Yet in Findhorn the eco-village community refers to a broader 'community of interest'. The whole includes those who live within the village and also those who live outside the village but have a direct interest in the village activities. These people also belong to the community of Findhorn. As an example some trustees of the Foundation live outside the village but are member of the community and have a key role in decision-making which affects all community members including residents. In other words, both villages were designed initially to be 'communities', yet communities of different kinds.

9.3 Eco-living and infrastructure

There are certain characteristics that are agreed as being essential within an ecologically sound and balanced community. The built environment should consist of structures that

are designed to suit and complement the natural environment, using natural, bio-regional and ecologically sound materials and methods of construction.

Both Damniyamgama and Findhorn prioritised the use of environmentally friendly raw materials and the use of recycled materials for construction. However Damniyamgama is not as advanced in this respect compared to Findhorn because construction here was undertaken in urgent and pressing circumstances. In the immediate aftermath of the tsunami, Sarvodaya made the final decision on house design after taking the people's views into consideration. Three types of house design are present which are based on passive solar access. In Findhorn village there is a much greater variety of design of eco friendly houses and people are able to design their house. All designs are acceptable as long as they are passed through the community planning process in order to ensure they are compatible with ecological and energy efficiency standards.

Turning to use of renewable energy uses, an eco-community should function with solar power and/or wind power or any other renewable energy source with the ability to feed back into the grid. In accordance with this need for sustainable energy use, Damniyamgama uses solar energy whereas Findhorn uses wind energy as its renewable energy source. Clearly the choice of these different energy sources is because of the very differing climates in the two places. As a village situated in tropical climate Damniyamgama is getting much more solar access. As a village in a temperate climate, Findhorn has much more potential with wind power. Damniyamgama is a good example of a community where low cost energy motivates residents to become more environmentally responsible. As documented in Chapter 7, research for this study has shown that residents are motivated to use solar energy just because it is low cost compared to getting electricity from the national grid line. Similarly in Findhorn, energy production is not just a low cost method but it also generates income by exporting

electricity to the national grid. Both villages are practicing walking and cycling as the predominant mode of transport within the village as an effort to engage in successful energy conservation and also to reduce environmental pollution.

Whilst similarities have been identified in approaches to the utilisation of renewable energy sources, albeit different ones in the two locations, research has also shown there to be differences in habits which affect energy consumption and which are culturally specific.

For example, in Sri Lanka it is the custom to hand wash clothes rather than putting them in to a washing machine. In Findhorn, almost all of the community residents use washing machines which inevitably consume a lot of energy.

Damniyamgama is not totally dependent on solar power for energy supply and a substantial amount still comes from the national grid. In Findhorn on the other hand, this is not the case. This village is a net exporter of electricity. Local conditions again affect energy consumption and conservation. Whilst Findhorn consumes a high amount of energy for home heating, this is clearly not the case in Damniyamgama. The general principle established is that local conditions such as climate and cultural habits directly affect all aspects of eco-living, notably energy consumption and so any eco-community should be 'judged' in terms of its efficiency by taking such local factors into consideration.

A key characteristic of an ecologically balanced community is that generation of waste is minimised and composting and recycling of all domestic waste is practiced. Both of the eco-villages studied implement an effective waste management strategy. This contributes significantly to each village's demonstration of environmental sustainability. In Damniyamgama, with the influence of a block leader approach for waste recycling as discussed in Chapter 7, the research has shown that there is a positive influence for

engaging more people in waste recycling. The appointment of a waste recycling committee has also been influential. In Findhorn eco-village information dissemination about waste recycling is undertaken by the New Findhorn Association. There is however no regular information dissemination within the community as there is in Damniyamgama. A potential reason for this is that waste recycling has already become habitual within the Findhorn community, and so information is unnecessary. It is an embedded process.

A further characteristic which demonstrates ecological balance is water conservation through rain water harvesting. Waste water is disposed of to the benefit of the environment and the community. Damniyamgama incorporated rain water harvesting tanks at its inception as integral to a water conservation strategy. This is not paralleled in Findhorn eco-village. Damniyamgama makes a substantial contribution to water conservation for the periods when there is less rainfall.

Both villages developed different technologies for the management of sewage. In Findhorn the living machine has potential to treat 65 cubic meters of waste water per day. In Damniyamgama sewage treatment was implemented on an experimental basis, since the technology has only been installed for treatment of the sewage coming from five houses. In Damniyamgama it is acceptable and normal to use open bathing wells and drinking water wells, which is more efficient for the reduction in consumption of water for washing and bathing. In Findhorn it is unusual to use open bathing wells, and would be regarded by many as impossible in the cold climate of Scotland. This is another example of cultural and climate differences affecting practice, technology and ecological balance within the community.

An ecologically balanced community's food comes primarily from local sources and is preferably organic. There is a remarkable differences between the two villages studied with respect to organic food production. Such difference is mainly due to restriction of available land. A very negative aspect of Damniyangama is lack of land which is available for community farming. Hence this village only practices home gardening which is not sufficient to meet the community fresh food requirements. By way of contrast, the Findhorn community owns 15 acres of organic farm and so is able to fulfil a major proportion of the community's fresh food requirement. The community supported agriculture scheme reduces potential food losses and also financial risks for the producers. Furthermore it reduces the ecological 'foot print' which is commonly found in the industrial world.

9.4 Eco-village business and economic sustainability

Turning to independent business, Findhorn places considerably more emphasis on the concept of economic sustainability than Damniyangama. The Findhorn Foundation owns a considerably large land area in two locations in Findhorn. Hence it has more opportunity to 'scale up' and promote both educational programmes and businesses which ultimately help to gain income for the running of the eco-village. As discussed in Chapter 8, there are several independent environmentally friendly businesses operating within the village and these make positive contributions to environmental education programmes. This is because when people come to learn about sustainable communities local businesses make the contribution of giving real life experience for the visitors about the true meaning of economic sustainability. As discussed in Chapter 5, a goal of any sustainable community design is to be more self-reliant at a community level. Community owned and operated services vary in their size and scale from individual home-based businesses to the management of large retail and commercial businesses. In the context of sustainable communities they should provide training, education and

other forms of assistance to participants and observers about how to meet the needs of the present without compromising the ability of future generations to meet their own needs in economic terms. Their common purpose is to meet local needs and to promote local employment. Indirectly this increases contact between producer and consumers.

A potential reason why Damniyangama is far more behind in terms of economic sustainability is because it is located in a much smaller land area and so there is very little opportunity for the village to 'scale up' independent businesses. Most especially there is no land available for community farming which is a key component of business and economic sustainability. There are shops and some independent businesses running within the village but their contribution to educational programmes and economic sustainability within the village is considerably lower than at Findhorn.

In a sustainable community it is common practice to trade in goods and services without cash through a Local Exchange Trading System (LETS). Accordingly, money remains in the community. Findhorn has introduced the LETS scheme for keeping money within the community and the initiation of further community business, Damniyangama is in the process of starting a community bank with the collaboration of Sarvodaya Economic Enterprise Development (SEED) unit. The community bank will act as a legal body for the initiation of community saving, providing loans at low interest rates and will serve as an institute for providing training for livelihood development.

Although both villages have several characteristics which make the villages relatively independent of the external world, under some circumstances they need to depend on outside sources as well. The Damniyangama community is still not in the position to make any financial contribution towards village management. They do however make a contribution to labour costs of village Shramadana activities which are organised to maintain common properties in the village.

9.5 Human relationships

As articulated by Gilman (1991, in Irrgang, 2005) one of the characteristics of an eco-village is that it is designed on a 'human scale'. This means that people are able to get to know and be known by the others in the community. Given that community gatherings and cultural activities play a major role in the fostering and development of a sense of community both within the village and as a whole, such human scale is very important. In both of the eco-villages studied, residents organise and participate in numerous cultural and educational activities. Without doubt these support positive and sustainable relationships. That said, research has identified differences in approaches in the two villages. In Damniyamgama events are organised by the whole community with extensive engagement in planning and participation. In Findhorn, however, the majority of cultural events are organised by the Foundation. The level of community involvement in each activity is purely a matter of individual decision. As a result, community interaction through cultural activities is comparatively low compared to Damniyamgama. In Findhorn, however, there is far greater opportunity for residents to meet informally, for example over communal meals arranged in the community centre. The communal meals are optional, and those attending gather and chat in an informal manner. Because Findhorn eco-village has both private houses as well as co-houses, this also affects the level of human interaction. These are inevitably more opportunities for interaction in the co-housing areas.

In both villages, facilitators or community leaders work in close collaboration with the people in order to get their active involvement in field activities and educational activities. Programmes are planned according to the needs of the community. In Damniyamgama eco-village there are regular meetings between facilitators/community leaders and the community. These meetings identify aspects of community interest and needs and then educational programmes are planned accordingly. There is a higher

community participation rate for such activities in Damniyamgama compared to Findhorn, but even so it is quite a challenge to achieve a hundred percent participation. The reasons for this include some individuals' reluctance to participate because of lack of time due to work and family matters, some consider that participation in such programmes is time-consuming and not good use of time, and others argue that they should be focusing on their personal problems rather than on communal environmental problems.

One of the weakest areas that was observed in the Findhorn village is the extent of whole community involvement in planning and participation, possibly because it lacks the grass root facilitators found in Damniyamgama. Here too, people articulate reasons for lack of involvement including lack of time, lack of interest and the fact that they have little to learn as they already understand the principles of human-scale living.

Once again we can identify cultural differences which impact upon the differing situations in the two villages. In Findhorn, the social norms of a western lifestyle lead people to be more concerned about personal privacy than communal interaction. Sri Lankan social norms are far more oriented towards co-operation and networking with other families and groups, 'family-centeredness' and socialising with people of all ages.

9.6 Management and decision making

The most notable difference in the overall management structure of Damniyamgama and Findhorn is that in Damniyamgama, authority for decision making lies with the village Sarvodaya Shramadana Sangmaya. Sarvodaya head quarters and its district office engage in a facilitation role for the implementation of activities which are requested and organised by the community. The Findhorn Foundation and the New Findhorn Association act as umbrella organisations and are responsible for the general

management and administration of the Findhorn eco-village such as maintenance of buildings, services and amenities.

As discussed in Chapter 5, each member of an eco-village should feel that they are able to participate in community decision making. At this early stage of development in Damniyamgama, all the members of the community are also members of the village Sarvodaya Shramadana Sangamaya. Hence all the members have an equal opportunity and right to contribute to decision making. Similarly at the early stages of Findhorn's development in the early 1970's, every member of the community was also a member of the Foundation. Today, however, some people join in community life but are not members of the Foundation. This situation creates inevitable tensions in both community interaction as well as community decision making. Hence final decision making is the responsibility of the Foundation, which makes decisions taking and evaluating the opinions from all community members. In other words, formal responsibility for decision making normally lies with the Trustees and a Management Committee. In occasional situations, the Foundation is alone authorised to take a decision. Also in certain circumstances such as Trees for Life, the Foundation has no authority to make any intervention on decisions taken by them, given that the decisions are not affecting community life in general. In summary, at Findhorn decisions are made by appropriate leading bodies and groups, but there is no structure whereby all community members engage with every decision.

8.7 Community-based environmental education

This study has shown that both Damniyamgama and Findhorn play a crucial role in community-based environmental education. Both do an excellent job both within the village and beyond. Delivery of education includes training, information sharing, courses and many forms of community living and interaction. Research has revealed

significant differences between the two villages in areas such as participation, target audience, course diversity, range of practical experiences and extent of educational impact.

Both villages focus on the educational programmes for the community which lives in the village. Alongside this, Findhorn prioritises the role of 'educating globally' whereas Damniyamgama does not. Priority concern here is the people living in the village. All of the education programmes undertaken within Damniyamgama are free and this fact encourages community participation. Indeed, it is necessary to deliver free educational programmes in the case of Damniyamgama, in order to educate and motivate the community towards more environmentally responsible behaviours. In Findhorn on the other hand, almost all of the community members who join the eco-village already have knowledge of the environment. Many join the community because they have a prior interest in environmental conservation. Furthermore, having to pay for educational programmes inevitably leads to lower levels of involvement in the case of Findhorn.

Because the educational 'audiences' are different in the two villages, so are methods of delivery, style of delivery and levels of content. In Damniyamgama, the audiences are 'grass roots' people. They have low levels of education, low levels of understanding and appreciation of the importance of sustainability and conservation. Hence great emphasis is placed on changing attitudes towards the pro-environmental behaviours. One of the strengths of the Findhorn programmes is that participants are generally well educated in other respects and are highly motivated to learn about sustainable development and behaviours that can address environmental degradation. Hence it is easy to deliver sophisticated knowledge and understanding about environmental problems and to motivate the participants towards more environmental responsible behaviour.

Interesting differences exist in course diversity in the two locations. In Damniyamgama, alongside environmental education we find other programmes including community meditation, community health development and livelihood improvement. Generally the range is rather small and take-up is low. In Findhorn on the other hand the range of education programmes is vast. Beyond environmental education it includes courses on group meditation, spiritual practices, healing through art, group building, group dynamics and many other topics as discussed in Chapter 8. Also Findhorn is famous as a spiritual organisation and there are many opportunities for the participants to get involved not only in educational programmes but also in personal programmes such as moving the inner sense towards spiritual practices. The Findhorn vision is to be a centre of spiritual service in co-creation with nature, which encompasses both education and community. It is relevant to the finding explained by Stern (1992) which is that environmental concern is a function of some deeper cause, such as underlying religious beliefs or post materialistic values. The Findhorn Foundation believes that when people become spiritual in nature, the consequence is that they are much more likely to show environmentally responsible behaviour.

In terms of personal education deriving from actually living in and experiencing the eco-village on a daily basis (as opposed to formal programmes), there must be differences deriving from very different activities and elements found in the two places. Findhorn eco-village consists of ecological buildings constructed from materials such as wood and straw and whisky barrel houses. It has renewable energy systems which export surplus to the national grid. It engages in local organic food production with a community supported agriculture scheme. It has independent businesses such as the Findhorn press, flower essence and other shops and sustainable economics such as Local Exchange Trading System (LETS). Inevitably then residents can experience a far wider range of educational experiences and activities on a daily basis than is possible in

Damniyamgama. Practical and field experiences are extensive. Many areas relating to sustainable development exist at a 'personal' interactive level. Damniyamgama has similarities such as the incorporation of ecological buildings, renewable energy sources, organic farming, waste recycling, strategies for water conservation and so on. But the alternative application methods and scale of application is very low compared to Findhorn, especially in areas such as ecological buildings, renewable energy sources, educational intervention and independent businesses. Furthermore, Damniyamgama lacks personal educational opportunities such as those deriving from community supported agriculture and a Local Exchange Trading System.

Both eco-villages make a substantial contribution for youth environmental education because these young people are recognised as being the leaders of future policy and practice. As detailed in Chapters 7 and 8, youth programmes are wide ranging and in Findhorn they include a focus on environmental responsibility in the school curriculum.

9.8 Links between research findings and literature reviewed for this study

Research conducted for this study in the villages of Damniyamgama and Findhorn has revealed a number of instances where findings reinforce those of existing studies and theoretical positions. In Chapter 3, the theory of 'hierarchy of needs' was referred to. This is certainly reflected in Damniyamgama. Here, because it is newly established for tsunami affected people, most residents have low levels of education, low income levels, and little interest in conservation. In line with the hierarchy of needs theory, this demonstrates that concern for environmental quality is something of a luxury which can be indulged only after more basic material needs are met. Members of the lower class typically have experienced only poor physical conditions, and thus are less aware that they live, work and play in polluted, overcrowded conditions. When tsunami victims were living in temporary shelters, it was hard to engage them in environmental

education programmes. At that time their basic needs such as shelter, food, clothing and so on were not at a satisfactory level. Yet when the time came for them move to the new eco-village, the people were self motivated to act in a more environmentally friendly manner and to keep their surroundings clean and attractive. This ties in with the theory explained in Chapter 3, that intrinsic motivation to act is an important predictor for pro-environmental behaviour.

Further illustrating the concept of motivation, it was found that people are not motivated to learn if the information presented is not relevant to them. In Damniyamgama it is important to concentrate on giving basic understanding about environmental issues, because people are not in a position to understand more technical and scientific aspects of the impact of environmental degradation. In Findhorn on the other hand almost all of the participants are well educated and they find direct relevance of programmes and opportunities to improving their own lives. They are able to comprehend and apply advanced concepts of environmental science and conservation.

As existing research literature demonstrates (as discussed in Chapter 3), another important determinant of behaviour is attitude. In Findhorn community members have an embedded positive attitude towards environmentalism and conservation and automatically lean towards pro-environmental behaviours. In Damniyamgama, prior knowledge and interest are lacking and so educational programmes need essentially to focus on the fostering of positive attitudes in the first instance.

According to Ronis (1989) and his model of environmental behaviour, 'everyday behaviour with negative consequence for the environment is habitual'. In accordance with this previously articulated model, the people of Damniyamgama were far more habitually inclined towards negative environmental behaviour whilst living in the coastal belt of Sri Lanka before the tsunami. They explain that throwing waste into the

river or on to the road was their everyday activity and no one made them aware about negative aspects of such behaviour. In order to help them make the transition between negative environmental behaviours and positive ones, Sarvodaya organised educational programmes as suggested by Hines (1987). These included delivering knowledge about environmental problems, holding discussions about alternative solutions to such problems suggested by the community, and giving necessary skill trainings to overcome the problems. As a result of these educational programmes, the community developed far more positive attitudes toward behaviours such as compost making and the recycling of non-degradable solid waste. Ultimately such behaviours became habitual in line with the theoretical position of Ronis (1989).

Observations for this study have certainly shown that lack of appropriate knowledge and attitudes go alongside inappropriate behaviours, and that this relationship may be addressed effectively through appropriately designed educational programmes. Chapter 3 also referred to the theory developed by Stern and Dietz (1994) who believe that people's attitudes and beliefs can be changed by educating and providing them with information. In line with this view, in the initial stages of development in Damniyamgama it was much harder to gain the active involvement of the people in environmental programmes organised by Sarvodaya. Yet after the receipt of a good deal of information and attending some programmes, the community without doubt developed more positive attitudes towards the goals of sustainability. Similarly in Findhorn, although people came with pro-environmental attitudes, the educational programmes and living experience within the community developed their interest in participating to a greater extent in programmes and indeed in becoming volunteers or residents in the Findhorn eco-village. Such changes came about in children as well as adults. As mentioned in Chapter 8, school children who participated in the educational programmes built-up strong attitudes about the need for an eco-friendly school.

Participants interviewed for this study claimed that informal, non-traditional and practical environmental programmes are more effective for delivering messages of environmental conservation and ultimately changing people's attitudes towards environmental protection than formal school-based programmes. This is very much in line with the position outlined in Chapter 3 which is that free-choice informal programmes are more effective because they are voluntary and in settings which people can enjoy whilst they learn. The needs and interests of the learner lie at the heart of them.

A further theoretical position discussed previously is that the well-being of the person is of paramount importance, irrespective of age, ethnicity or faith. In the eco-village model everyone living within the community becomes involved in educational programmes. Programmes are all-inclusive and have no boundaries for age, nationality or religion.

The concept that people's environmental concern is for the well-being of the human kind was applied in the initial stage of awareness programmes in Damniyamgama. There, environmental education was delivered through developing people's understanding about the severe impact on human life that happened as a result of the tsunami and that this was related to low plant density along the coastal belt. From this position it was easy to deliver the message of the importance of plants and the detrimental effect caused by removal of the world's plants and forests.

Turning to the subject of the influence of social norms on pro-environmental attitudes, we may take an example from Damniyamgama. Here the introduction of compost toilets was prevented by social norms. This is because in Sri Lankan culture compost toilets are not socially accepted despite the fact that they are environmentally friendly. Social norms are also relevant to recycling behaviour in both case study villages. People who reside in the villages engage in recycling not just because it is environmentally friendly

but also because it is a social norm within the villages. People who have not previously been familiar with recycling tend to shape their behaviour in line with accepted social norms. By way of an exception, in Damniyamgama it was discovered that some families with no interest in recycling depended upon personal norms and disregarded the accepted community social norms.

Let us now turn to the subject of gender differences and environmental concerns. In Damniyamgama it was found that females displayed more pro-environmental attitudes than males and they engaged more than men in waste recycling activities. On the other hand males preferred to engage with activities such as home gardening. In Findhorn however no clear gender differences were identified with respect to pro-environmental behaviour. Research did however reveal a more significant involvement of women in educational programmes and there is higher percentage of women members in the Foundation compare to male members.

9.9 Areas for potential development in the eco-villages studied

The intention of this study is for the data obtained to be informative for those wishing to learn more about eco-villages; their nature, aims, characteristics and differences. It is also intended that the case studies of Damniyamgama and Findhorn are useful to those involved in managing these villages and others beyond them. Hence as a result of the visit to the two places and the observations made in them, it is possible to make a series of recommendations for future developments. Some of these suggestions are already on the agenda of the communities; others are desirable activities and ideas which could make the eco-villages even more successful in terms of achieving their basic missions.

9.9.1 Damniyamgama

- It would be desirable to develop diversification in educational programmes to include innovative areas such as waste management, conservation of water and electricity and organic home gardening.
- There is a need to encourage awareness of national and international best practices in the field of sustainable development and to motivate the community to buy organic products.
- It would be highly desirable to improve the standard of educational programmes so that they will attract local, national and international level participants.
- The community should be empowered through capacity building training in areas such as decision making, spiritual dimension and group or team building.
- The relationship between village and Local Government should be strengthened for the benefit of both parties. Local Government is able to support legal activities in the village and can promote the village as a model for the demonstration to others of basic principles of sustainable development and community environmental education.
- The village should work towards the incorporation of a complete range of sustainable design practices and develop strategies for the initiation of independent businesses. Furthermore it should consider the introduction of a Local Exchange Trading System (LETS).
- The land area should be scaled up for the improvement of local organic food production and to give opportunities for others to join in and get experience of the community life.
- The community should develop strategies to be self sustainable in the areas of electricity, water, and maintenance of infrastructure such as roads.

9.9.2 Findhorn

- Given that the community as a whole lies at the heart of sustainability, there should be significant strengthening of whole community interaction. Every effort should be made to involve the whole community in decision-making and participation in education.
- Along similar lines, cultural activities should be organised with the participation of community members instead of outside resource persons. A move in this direction would encourage the sharing of skills and talents, social interaction and a feeling of common ownership.
- Increased funding is needed in order to provide no cost educational programmes for the people who actually live in the community.
- The community should develop strategies to be self sustainable in the area of water management.
- Organic farming and other independent businesses should be scaled up to achieve economic sustainability, and provide much needed additional funding to make no cost activities and education available for all.
- The community should be encouraged to make more use of community currency, car pooling and public transport.

9.10 Concluding comments

There has been much debate in our world on how to encourage local communities to be aware of environmental conservation and practice behaviours that are compatible with sustainability. The significant problems facing community-based environmental education are lack of community motivation and interest, lack of an appropriate curriculum and strategies for delivering effective educational programmes, and lack of funding.

This thesis has presented and analysed case studies of the planning, development and achievements of the multi-award winning eco-village at Findhorn in Scotland and of the newly established eco-village in Kalutara, Sri Lanka. The study has illuminated many practical examples of the efficiency and success of developing and implementing community-based environmental education. It has highlighted numerous examples of how eco-villages can provide valuable lessons for the development of sustainable human settlements.

The work has demonstrated that a well founded and run eco-village is a socially harmonious, economically viable and ecologically sustainable settlement that enables human beings to live cooperatively with each other and with the natural environment. It also shows that 'living villages' are splendid examples of community-based environmental education, where community members will inevitably learn through the 'living' experience on a daily basis. Formal educational programmes are excellent 'value added'.

When a whole community engages with environmental awareness and practices, attitudes change and each individual takes responsibility for their own behaviour. It has been shown that this complex process links motivation, attitudes, knowledge and behaviours and is backed up by previous research findings which support the view that individuals may be persuaded to change behaviours when they see relevance to their own lives. The study concludes that living in an eco-village is one of the most successful motivators for change.

Present research has also shown that there are significantly different cultural factors which impact upon life in and the success of the two villages which have been studied. Inevitable as this might be, it raises interesting questions about eco-village development globally. The local context is vital, while many elements and principles are universal.

The subject of community-based environmental education is in its infancy both in practical terms and as a subject for research and analysis. This thesis makes an original contribution to the literature in this field. No previous study has made a comparison of community-based environmental education in Sri Lanka and the UK. Research on eco-villages is also in its infancy.

It is recommended that future research may focus on the longer term development of Damniyamgama and Findhorn, the extent to which cultural differences affect long term development, and the success or failures of attempting to transfer elements and principles embedded in Damniyamgama and Findhorn to other global locations.

Without doubt, community-based environmental education, in both informal and formal forms, is a powerful tool in generating sustainability. Living in an eco-village is similarly a powerful way of embracing community-based environmental education.

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